

Water Quality Temperature Criteria Guidance

Collected Comments

(Comments submitted from
October 10 to November 26, 2002)

Part III – Native Tribes, State Agencies
and Federal Agencies

U.S. Environmental Protection Agency
Region 10 – Pacific Northwest

December 2002

Tribal Comments

November 26, 2002

John Iani
EPA Regional Administrator
EPA Region 10
1200 Sixth Avenue
Seattle, WA 98101

Dear Mr. Iani:

We would like to thank EPA Region 10 for the opportunity to participate in this process and to comment on the EPA Region 10 Draft 2 Temperature Guidance Criteria (the draft guidance). Our staff became involved with EPA's regional temperature guidance criteria project when it began in 1999. This second draft is a marked improvement from EPA's first effort and EPA staff is to be commended for their work. We also noted the incorporation of many CRITFC staff comments in the revised draft guidance.

As you are aware, abundant, cold, clean water is essential to salmonid survival. The challenge of this project has been to create a temperature standard that supports the biological requirements of salmon in a highly altered landscape. We are all looking for the best solution to this problem. CRITFC appreciates the need for EPA to address the biological needs of salmon within the confines created by the natural limitations of the landscape. We further appreciate EPA's need to balance these biological requirements against the limited resources of agency and tribal water quality programs.

The restoration of salmon however, creates an immediate, critical need to restore aquatic habitat. It is imperative therefore, that the temperature guidance criteria translate into meaningful protection for salmon across the landscape. Prior to endorsing EPA's new proposal, we are seeking clarification on certain technical and regulatory recommendations presented in the draft guidance. In the effort to meet schedule deadlines associated with this process, we believe there was inadequate discussion between EPA and tribal staff on these key guidance recommendations.

Our comments are divided into two sections. The first section highlights elements of the guidance that we feel are critical to restoring and maintaining a high quality thermal regime for salmon. Inclusion of these elements is needed for CRITFC support of the draft guidance. The second section details elements of the guidance that we feel are weak due to the technical analysis, uncertainty associated with the programmatic application, or because a critical element was omitted from the guidance. We are requesting further dialogue on these issues.

The CRITFC tribes' goal, which we believe EPA shares, is to develop a temperature guidance criteria that provides meaningful protection for salmon and other aquatic organisms. Although this draft is a positive step forward in this

effort, there are elements that require further discussion before we at CRITFC can offer our full support. We strongly encourage EPA to engage the Tribes in further discussion on the draft temperature guidance criteria and water temperature. If you have any questions, please feel free to contact me or have your staff contact Patti Howard or Dale McCullough here at CRITFC.

Sincerely,

Don Sampson
Executive Director

Cc. Randy Smith, US EPA
Dru Keenan, US EPA
John Palmer, US EPA
Dave Johnson, Nez Perce Tribe
Rick Eichstaed, Nez Perce Tribe
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November 26, 2002

To: John Iani, EPA Region X Administrator

From: Don Sampson, Executive Director

Subject: Columbia River Inter-Tribal Fish Commission (CRITFC) Comments on the Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards

I. Guidance Elements That CRITFC Supports

EPA's draft guidance contains several important departures from their first effort. The primary difference is that the biological requirements of salmonids (in contrast to natural thermal potential) establish the foundation for development of the temperature standard. Salmonids evolved in cold water with a diverse thermal regime. EPA highlights this important relationship in the discussion on water temperature and the evolution of salmonid life-history traits (Section IV.I). The draft guidance also presents an informative summary of how anthropogenic landscape activities have altered the historical thermal regime of Pacific Northwest waters. Finally, the draft guidance provides evidence for human-caused thermal degradation as a factor in the decline of salmonids in the Pacific Northwest (Section IV.3, Section V.I *Current versus Potential Use*, V.1.2 ...cold-water refugia narrative).

In order to be protective, the temperature standard must significantly reduce the risk to salmonids from human-induced elevated water temperature. Including this discussion as part of the draft guidance indicates willingness on the part of EPA to engage in meaningful actions that will reverse and prevent further thermal degradation in Pacific Northwest waters.

Another strong feature of the draft guidance is EPA's support for the need to protect existing cold water (Sections V, V.I, V.2, VII) and the restoration of adjacent degraded habitat (Section V.2). Protecting or restoring these waters in order to provide quality habitat for stressed salmonid populations makes biological sense. Moreover, it is consistent with the Clean Water Act (CWA) and EPA's federal trust responsibility to the tribes and tribal treaty resources.

Other positive elements of the guidance include:

- **Section II.** Provides a summary of the regulatory framework for water quality standards.
- **Section III.** Provides a good discussion on why the temperature criteria recommended in EPA's 1986 Quality Criteria for Water (Gold Book) are not appropriate for Pacific Northwest waters.

- **Section V.** Adoption of cold water salmonid uses and numeric criteria to protect those uses is a good approach. Adoption of regulatory provisions to protect existing water temperature that is colder than the numeric criteria is critical.
- **Section V.1. *Numeric Criteria Apply Upstream...of Use.*** Second paragraph. It is very important to recognize the need to protect upstream cold waters as these upstream waters significantly affect temperatures downstream. It is also consistent with the CWA to protect the most sensitive use—for example, applying a more protective standard in the headwaters for bull trout.
- **Section V.1. *Current vs. Potential Use.* First paragraph.** EPA “*advises States and Tribes not to limit salmonid use designations to where and when salmonids exist today for areas with thermally degraded habitat.*” This statement is very good. Maintaining sustainable populations and recovery will depend upon restoring habitat quality and quantity in locations that were used historically.
- **Section V.1.1. Table 3 *Salmon/Trout Migration on Lower Mainstem Rivers.*** EPA makes a very good recommendation in requiring all feasible steps be taken to restore and protect the river functions that could provide cold water refugia in river segments in the lower mainstem rivers (i.e., the stream zone with water temperatures of 18-20°C). It would also be advisable to make this requirement for the stream zone with temperatures of 16-18°C. Maintaining floodplain function is critical wherever floodplains exist. Floodplain restoration and reconnection to the stream channel is important to restore habitat complexity and provide cold water refugia.
- **Section V.1.2. *Salmon and Trout...(...narrative provision).*** We support a narrative provision to restore and protect river function that will create cold-water refugia.
- **Section VII.** This section brings together three critical elements needed to protect salmon and restore temperature water quality. For example, salmonid sustainability is not only linked to the distribution of thermal habitat but to cold water abundance. EPA further highlights the importance of protecting temperature in the headwaters in order to provide cold water input to lower river reaches. Further, the draft guidance does not differentiate between fish-bearing and non-fish-bearing streams in their importance in contributing cold water.

EPA gives strength to the draft guidance by relating compliance to watershed restoration. The list of recommended actions that can be taken to reverse the warming of rivers is very useful and informative. Although there is a weak history associated with anthropogenic cooling on a broad scale, it is reasonable to document the many known associations between altered watersheds and thermal warming. Watershed restoration is our most logical course of action for restoring salmon habitat. The list of actions included in the draft guidance could be broadened, but EPA has done an excellent job in providing a sample of some of the most effective methods.

II. Guidance Elements that Require Further Clarification

Section V. EPA Region 10 Recommendations for Pacific Northwest State and tribal Temperature WQS to Facilitate Expedited CWA and ESA Review

Section V criteria recommendations do not adequately account for the increased time salmon spend in warmer water due to reduced flows. Maximum temperature and time of exposure are the two factors that control the magnitude of the biological impact. This issue is a particular concern along the mainstem Columbia and Lower Snake River where hydropower structures delay out-migrating smolts and returning adult spawners. EPA should consider whether a criterion is needed for

situations where the thermal perturbation results from an increase in exposure or a major temporal shift in the peak temperature.

Cold Water Refugia In the draft guidance, EPA assumes that the presence of cold-water refugia will compensate for the 20°C numeric criterion (Section V.I General Targets for Protective Criteria, V.1.1 Table 3, V.1.2). Reliance on restoration of refugia, however, is insufficient to ensure the appropriate thermal regime in large altered rivers. Continued risk to salmonids is a likely outcome as it is unclear how much cold-water refugia is required and whether it is practical or technically possible to create this refugia in large rivers such as the Columbia and lower Snake Rivers. We would like EPA to provide more information on how the guidance will effectively address this uncertainty.

Biologically Based Criteria The purpose of biologically based criteria is to identify temperatures that do not pose a risk to fish guilds from lethal and sublethal temperature exposure. The recommended criteria however, have numerous allowances such as:

- criteria based on upper end of optimal,
- a 7DADM value which allows temperature spikes above the mean of the daily maxima,
- ignoring the effects of food limitation or competition for the cold water thermal guild,
- exemptions for the warmest days, and
- lack of technical requirements for designating a "core" area.

These allowances potentially increase the risk to fish from repeated exposure to sub-lethal temperatures. We would like to discuss these points further with EPA.

Application of Criteria to the Landscape Section V also lacks clear guidance on how a state or tribe is to match the recommended numeric criteria (Section V.1 Tables 3 and 4) to a salmonid use and then apply these numbers to the landscape. The lack of this scientific rationale raises several concerns. First, when designating a beneficial use and its seasonal application, there is the potential to overlook beneficial uses that have been eliminated or greatly reduced due to thermal degradation. Second, a methodology for determining the spatial breaks (e.g., the "core" areas or "furthest extent of use") along a river reach is not presented. EPA should specify the data requirements needed to designate core areas and furthest extent of use.

Mixing Zones We question whether it is appropriate to include a mixing zone provision as a requirement for expedited Water Quality Standards review by EPA and the Services (Section V and V.3). Due to differences between the assimilative capacity of each water body, and uncertainty surrounding the programmatic application of mixing zones, it is unclear if a broad base mixing zone requirement would be sufficiently protective. Further, the EPA guidance on the Water Quality Standards Regulation (40CFR 131) recommends that mixing zone characteristics be defined on a "case-by-case" basis (EPA 823-B-94-005a, August 1994).

As written, the draft guidance does not provide sufficient detail on the amount of flow and size of the mixing zone allowed. Exposures of <2 seconds at 32°C may be protective according to equations on acute effects, but the effect of a thermal increase is rarely <2 seconds as the temperature may decrease and remain at 30°C for some period. Finally, the draft guidance does not recommend that states or tribes measure the biological effects on fish migrating through the mixing zone.

More in depth discussion with States, Services and EPA staff on this issue would be helpful. We do, however, support the intent of the proposed provision language in (Section V.3, paragraph two) recommended by EPA.

VI. Approaches to Address Situations Where EPA's Recommended Numeric Criteria Are Inappropriate or Unachievable. Although EPA's recommendations (e.g. site-specific criteria, use attainability analysis) are currently available for use in state and tribal water quality standards, programmatic application of these approaches is not well documented in the draft guidance. We are concerned that these approaches therefore, might be used to facilitate a change in use or determination of unattainable use in place of achievable, water temperature improvement. EPA should provide guidance on the requirements for approving changes to numeric criteria or beneficial use designations.

We are also concerned that EPA recommends the use of wilderness areas as reference sites without providing a definition or description of natural background conditions. EPA assumes that a reference to wilderness areas denotes sufficient clarity on this point. Although wilderness areas are less likely to be disturbed compared to unprotected lands, wilderness areas are not immune to human land use activities that impact water temperature.

...(2) Mineral activities, surveys for mineral value. Nothing in this chapter shall prevent within national forest *wilderness* areas any activity, including prospecting, for the purpose of gathering information about mineral or other resources, if such activity is carried on in a manner compatible with the preservation of the *wilderness* environment...(4) Water resources, reservoirs, and other facilities; Grazing within *wilderness* areas in the national forests designated by this chapter; (1) the President may, within a specific area and in accordance with such regulations as he may deem desirable, authorize prospecting for water resources, the establishment and maintenance of reservoirs, water-conservation works, power projects, transmission lines, and other facilities needed in the public interest, including the road construction and maintenance essential to development and use thereof, upon his determination that such use or uses in the specific area will better serve the interests of the United States and the people thereof than will its denial; and (2) the grazing of livestock, where established prior to September 3, 1964, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture.

16 USC § 1133 (c).

We therefore recommend that EPA include more detail on the database requirements needed to determine natural background conditions regardless of whether a stream lies within a wilderness area or developed watershed.

Use Attainability Analysis EPA's reference to "irreversible impact" in the context of a use attainability analysis (UAA) is inappropriate (Section VI.2, last paragraph, first sentence). EPA guidance on the Water Quality Standards Regulation (40CFR 131) indicates that a state must first demonstrate that a use is not feasible prior to removing the designated use (EPA 823-B-94-005a, August 1994). Furthermore, a UAA is defined in the Water Quality Standards Regulation (40 C.F.R. 131.3) as a "structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors as described in §131.10(g)". This definition suggests that the purpose of the UAA is to first determine why a beneficial use is not being met. As written, the draft guidance implies that a state or tribe has

discretion to make this determination of non-attainment prior to conducting the technical analysis. Finally, as stated previously in our comments on the first draft guidance, a determination of “irreversible impacts” is a policy-level decision involving government-to-government consultation. We therefore recommend that EPA remove reference to “irreversible impact” and rephrase the above referenced sentence. Inclusion of the appropriate regulatory citations is also recommended.

A requirement for government-to-government consultation with any UAA approval process for a proposed designated use change must also be included. This consultation is necessary to insure that disproportionate cultural or financial losses to tribes are fully considered. We would also like to see guidance on the type of analysis EPA requires for a UAA for temperature compliance. This information is needed to ensure scientific rigor and protection of the designated use.

Other concerns include:

- **Section V.1. Table 1.** Temperature Consideration Column for Spawning and Egg Incubation. What is meant by “Results in Good Survival?”
- **Section V.1. *Cold Water Salmonid Uses.*** EPA intends to allow States and Tribes to adopt seasonal uses where a particular use applies for only a portion of the year. The risk with this provision is that uses known to occur at the present time are biased heavily according to current databases on seasonal use. This information is, in many cases, very recent and reflects distribution in altered streams. EPA should not permit changes to a water quality standard for seasonal use unless the historical uses are thoroughly documented, appropriate reference streams are available, and it is demonstrated that additional factors are not limiting the ability of fish to occupy the stream.

Examples that illustrate the combined application of sub categories and seasonal uses, particularly during summer conditions would provide a clearer picture of how this provision would work in a water quality standards program.

- **Section V.1. Use of the 7 Day Average of the Daily Maximum....** The technical discussions on the “equivalent” constant temperature, chronic effects are difficult to understand. EPA assumes that in a fluctuating temperature regime where the 7DADM value is 18° and the weekly mean is 15°C, fish would respond as if they were subject to a constant temperature of 16.5°C. The ability of fish to adjust to a temperature midway between the mean and the maximum has been demonstrated in scientific studies. Information from these studies can be used to identify the “equivalent” acclimation temperature expressed as a constant temperature. Other studies, however, have shown that the equivalent temperature is closer to the maximum temperature in a fluctuating temperature regime. Using the mid-point as the representative temperature, therefore, may not be as protective as assumed in the draft guidance. That is, if the fish actually adjust their metabolism to a temperature closer to 18°C, the equivalent constant temperature would be >16.5°C. A constant temperature of 16.5°C may be just above the upper end of optimum for chinook. However, based on sockeye and coho literature (see McCullough and Spalding 2002), the optimum temperature at satiation feeding is 15°C for each species. This means that under normal field conditions with food limitations, one could expect optimum temperatures that are less than 15°C. Depending on the extent of this food limitation, the reduction in the optimum temperature can be very substantial.

In addition, the CWA requires that water quality standards protect the most sensitive member of the guild. Selection of 16°C however, cannot be construed as being protective

of the most sensitive species. The application of this temperature value as a 7DADM further weakens its protectiveness.

“The temperature for which there is optimal juvenile growth increases when food supply is unlimited.” This sentence is not worded correctly. This statement is relative to environmental conditions and has meaning only with respect to some baseline condition. At maximum food supply under optimum temperature conditions, the fish is able to grow at its maximum rate. As the food supply becomes more limiting, the growth rate declines. Under a specific food limitation (e.g., 50% of maximum levels), the temperature that results in optimum growth declines.

- **Section V.1. Criteria Apply to all but Unusually Warm Conditions.** Limiting the recommended temperature criteria to water temperatures occurring when air temperatures exceed the 90th percentile of the yearly maximum 7DADM value is inappropriate. Even though extreme air temperatures naturally occur, it is during these times when water temperature impacts from anthropogenic warming are greatest. If it is always the case that those streams that exceed criteria during extreme air temperature conditions also will exceed the standard on other days, there is no valid reason to ignore the extreme condition.
- **Section V.1. Current versus Potential Use.** Establishing use designations for rearing and spawning in many cases must depend upon best professional judgment, but this judgment can be supplemented with use of models or expert systems. For example, applying regionally specific relationships between a species and habitat characteristic (e.g., stream gradient, elevation, channel width, etc.), creates a high probability that a stream reach would be used for a particular use if the habitat were restored. Historic distribution maps may also be available. It is possible to apply salmonid distribution data from high quality streams to similar but degraded streams in order to determine the potential extent of seasonal use.

“Because the numeric criteria are intended to apply ... reflect the mid-point of the optimal range for various salmonid uses.” We have several concerns with this statement. First, EPA claims that the criteria apply to the warmest years, but in fact the upper 10% of annual, extreme air temperature conditions will be exempt from standards. In addition, EPA does not provide guidance on the minimum monitoring requirements. These requirements are necessary in order to insure that the best temperature data are available for criteria compliance decisions. In addition, EPA should provide guidance on how the state or tribal process for determining water quality compliance.

Another concern with this recommendation is that in reality, the standard does not necessarily apply to the furthest downstream extent of use. This outcome occurs because the furthest downstream extent of use normally equates with the point where daily maximum water temperatures reach approximately 22°C. EPA recommends three zones for the cold water thermal guild—16, 18, and 20°C respectively, as the appropriate temperature for the downstream end of each zone. Consequently, even though the draft guidance recommends that the criteria apply upstream of the furthest downstream extent of use, the furthest extent of use corresponds to either 18 or 20°C as a 7DADM value. In effect, EPA is recommending that states and tribes identify core, rearing areas and then apply 16°C 7DADM as the standard for that stream zone. It is reasonable to expect optimal conditions for the most productive areas. However, there is also discretion with how these core areas are identified. Consequently, even though the recommended temperature criterion may be sufficiently protective, it becomes ineffective in its

application if the designated core area is small. The combination of minimizing the extent of the core area, elevating the criterion to upper end of optimal, and applying other statistical manipulations (e.g., 90th percentile exclusion, 7DADM statistic, and state processes for recognizing violations) further reduces the protectiveness of the criteria.

- **Section V.1.1 EPA Recommended Salmonid Uses and Numeric Criteria. First sentence.** EPA's recommended criteria would protect against lethal temperatures and probably provide reasonable protection against competitive advantage with other salmonids. However, these criteria do not provide sufficient protection against food limitations in the field. For example, with bull trout, the 13°C criterion is a meaningful optimum only where there is very abundant food providing feeding to satiation. A criterion of 12°C affords a small amount of protection for food limitation, but should apply to the full extent of use. A reduction in optimum growth temperature under conditions of food limitation can be substantial as indicated by the extensive literature review on brown trout (which have a similar growth optimum) by Elliott (1994). It is unlikely that a 1°C reduction in temperature from 13°C is sufficient to account for the predominant levels of food availability in the field. The peer review group advocated for a lower number as being more protective.

Table 3. The 16°C 7DADM criterion for salmon/trout applies only in core juvenile rearing areas. The core area is defined as the furthest downstream extent of “**current summer use for areas of degraded habitat.**” It is difficult to identify core habitat under conditions of extreme thermal degradation. Moreover, these conditions would likely have a current summer salmon/trout distribution restricted to headwater areas. Salmon populations in many interior streams are typically present in extremely reduced densities limiting our abilities to identify the furthest downstream presence. The most damaged streams would provide the most spatially restricted view on core areas. For example, the North Fork John Day has numerous tributaries that have individually experienced severe impacts limiting salmonid distribution in some of these tributaries. However, the North Fork mainstem has juvenile rearing extending downstream to nearly the mouth in late spring. Application of 16°C to this location would necessitate maintenance and restoration of colder streams in the headwaters.

“*For areas of minimally degraded habitat, ... that currently meet this criteria.*” Again the term minimally degraded is not clearly defined. Furthermore, given the current low population densities and patchy distribution of salmon/trout in many streams, it may not be possible via sampling programs to identify these core areas. In addition, the core area, as expressed by highest density, could vary monthly due to the natural migration patterns of fish species in streams.

- **Section V.1.2 Salmon and Trout “Core” Juvenile Rearing.**
- **Section V.1.2 Salmon and Trout....Migration. Last Sentence.** This section minimizes the importance of the increased risk to juveniles and adults subject to prolonged exposure to sublethal temperatures. While the juveniles that are emigrating as smolts will normally have left the stream before the maximum summertime temperatures occur, juveniles do remain that rear during the summer and over winter prior to emigrating the following year. Snake River fall chinook juveniles migrate downstream in mid-to-late summer at the height of the summer maximum temperatures and under very slow water flow conditions. The late migration is due to the cold springtime conditions from dam releases that slow egg development and cause late emergence. In addition, sockeye adults migrate during June-August, summer chinook during mid-summer, and summer steelhead during mid-summer to late fall. Consequently, it is not accurate to claim that adults are fully protected during the summer.

- **Section V.1.2 Salmon and Trout...(...narrative provision). Paragraph 3.** EPA's recognition of this problem is an important statement on the scientific evidence in support of thermal effects to species and life stages. It is, however, important to impose a criterion for duration of exposure. Maximum temperature, duration of exposure, and seasonal thermal regime are three of the key interacting variables determining biological effects (EPA 1972).
- **Section V.1.2. Use of a State's or Tribe's "Natural Background" Provisions.** It may be erroneous to assume that waters in wilderness areas are not influenced by human impacts. In some circumstances, resource extraction and other uses may be allowed in some wilderness areas thereby adversely affecting watershed function (**Reference**). A definition of wilderness area should be provided. It is unclear how promulgation of the proposed Watershed Rule (as yet not available for review) will impact the TMDL process for impaired waters characterized by high natural background conditions and human impacts.
- **Section V.2. Adoption of Regulatory Provisions.....Criteria. Paragraph 2.** EPA does not adequately define what is meant by "measurable" and "generally prohibited" thus potentially allowing for small, yet significant cumulative increases in temperature. This type of temperature increase would be counter to the recommendation and decrease protection to fish.
- **Section VI.1. Adoption of Site-Specific Numeric Criteria that Supports The Use. First sentence.** In this section, EPA establishes the framework within which the evidence supporting a site-specific criterion is evaluated. In the bull trout example, available scientific evidence as provided in the report by McCullough and Spalding (2002) and supported by the peer review process set up by United States Fish and Wildlife Service, shows that a temperature criterion of 11°C is superior to one of 13°C for bull trout protection. Food limitation in the field is likely to be significant enough to justify at least a standard of 11°C. The draft guidance does not provide a framework for determining environmental conditions (e.g., food limitation) where a numeric criterion of 13°C would be appropriate.

"Another example may be where there is exceptionally high natural diurnal temperature variation and ... (e.g. a maximum weekly mean with a daily maximum cap)." This statement is based upon a misconception of thermal effects and is not supported by the scientific literature. This statement assumes that it is acceptable for the temperature maximum to exceed the upper end of optimum as long as the diel minimum temperature is low, thereby creating a mean temperature that remains within the optimum range. This scenario, however, is similar to the MWAT where maximum allowable temperatures between the optimum and incipient lethal are acceptable.

Thermally degraded stream reaches typically have elevated maximum temperatures accompanied by a decreased minimum. This situation can result in a relatively constant mean temperature. However, the thermal impacts to fish are not fully compensated by lower nighttime temperatures due to the increased stress from major diel shifts in temperature. The biological criteria that the technical project team supported provided uniform protection based on similarities in biological response to temperature among the species or life stages of each thermal guild.

- **Section VI.2. Use of a State's.....Provisions.** *"...because the water body's temperature exceeds both the numeric criteria and the natural condition."* A stream is placed on a state or tribe's 303(d) because it does not comply with CWA water quality criteria. *When the State or Tribe develops the TMDL,which is used to set TMDL allocations."* As written, it is

difficult to see how a narrative criterion would be as protective as a numeric standard in streams where thermal degradation has occurred. EPA does not indicate the minimum data requirements to determine natural background conditions. Furthermore, TMDL calculations depend on temperature modeling, which is limited by the lack of ability to model floodplain effects, wetland function, and natural flows. Without accurately modeled streamflow, natural potential cannot be predicted accurately. We support EPA's recommendation for reestablishing alluvial river segments and associated hyporheic flows, but the natural flow regime must also be considered in predicting potential temperatures.

November 15, 2002

John Palmer
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Dear Mr. Palmer:

We would like to thank EPA Region 10 for the opportunity to comment on the Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (draft guidance). The Nez Perce Tribe (Tribe) appreciates EPA's efforts to formulate temperature guidance criteria that support the biological requirements of salmon in a developed environment and the complexity inherent in such an undertaking.

We are pleased to see the discussions in the first four sections of the draft, including the life histories of salmonids, although abbreviated, the "shrinking" of habitat resulting from human-caused elevated water temperatures, and the emphasis on the requirement for temperature criterion that will protect designated uses. As you are aware, proper temperature is a vital habitat variable essential for salmon survival.

However, as you are also aware, salmon are threatened with extinction. In the Snake River, juvenile and adult fish are subject to water temperature that routinely exceeds state standards, causing stress, delayed migration, and death. It is critical to restore aquatic habitat, and therefore crucial that the temperature guidance criteria render meaningful protection for salmon. Upon reviewing the draft guidance, we are not fully convinced that this guidance will accomplish temperature criteria that are completely protective of salmonid spawning, rearing, and migration. Prior to supporting EPA's proposal, we are seeking clarification on certain recommendations laid out in the draft guidance.

The first four sections of the draft provide background information necessary to understand the implications of, and requirements for, temperature standards. We support the inclusion of the information in these sections. They include good background of regulatory requirements, including EPA's federal trust relationship with federally recognized tribes. Additionally, these sections include good discussion on why EPA's current criteria for temperature in *Quality Criteria for Water 1986* may not protect

vulnerable species in the Pacific Northwest based on chronic and sub-lethal effects of elevated temperatures outside the optimal range for salmonids.

The draft includes valuable information on the implications of human activities that alter the thermal regime of water bodies, decrease cold-water refugia, and elevate temperatures above natural levels. Understanding the relationship between human activities and watershed function is fundamental to developing protective standards. We support the narrative provision to restore and protect river function that will create cold-water refugia and the discussion on the relationship between flood plains, ground water exchange and cold water.

Another positive feature of the draft guidance is the inclusion of brief salmonid life histories and the “shrinking” of habitat as a result of elevated temperatures. Also key is EPA’s support for the need to protect existing cold water and the restoration of adjacent degraded habitat. Assuring quality habitat for vulnerable salmon populations makes biological sense and is consistent with the Clean Water Act and EPA’s federal trust responsibility to the tribes.

The Tribe supports the inclusion of the components in the last section of the draft as well. The examples of on-the-ground activities that can be done in order to meet water quality standards includes a good overview. Including this discussion as part of the draft guidance indicates EPA’s commitment to meaningful actions that will reverse and prevent further water quality degradation in Pacific Northwest waters.

Included with the above information, the Tribe would also like to see a discussion on the benefits of a natural hydrograph. Consideration of the importance of a water body’s flow regime and its relationship to temperature in the background portions of the draft is a key component in understanding human impacts, watershed function, and salmonid life stages. A discussion on the benefits of achieving a more natural hydrograph in relation to human impacts would be useful in the discussion of on-the-ground actions.

The draft includes several positive components, and EPA staff is to be commended for their work. However, there are also items that the Tribe feels are not sufficient to ensure fully protective water quality standards or need clarification. These are listed below.

➤ **Section V.1. Cold Water Salmonid Uses and Numeric Criteria to Protect Those Uses**

Following Tables 1 and 2:

Criteria Apply to all but Unusually Warm Conditions (pg. 19)

The last paragraph is difficult to read. We would like clarification here.

Current versus Potential Use (pg. 20)

Establishing use designations that depend upon “best professional judgement” seems to lack direction. This section is vague, and we feel more guidance is necessary.

Integrating the General Factors in Selecting Protective Criteria (pg. 21)

“Adopting numeric criterion near the warmer end of the optimal range that is applied to the ... (near worst case) will result in temperatures near the middle of the optimal range *most of the time where most of the use occurs*” (emphasis added).

Achieving temperatures in the optimal range “most of the time where most of the use occurs” does not offer full protection of beneficial uses.

The draft states in a previous section, **III. Relationship of Guidance to EPA’s 304(a) Criteria for Water Temperature**, that chronic effects, which can occur outside of the optimal temperature range, can adversely impact the health and size of vulnerable fish populations (fourth paragraph). The draft guidance additionally states that “adverse effects are minimized as long as temperatures remain within the bounds of the optimal temperature range” (pg. 17).

EPA has stated, regarding CWA/ESA coordination, that its “statutory responsibilities are carried out by ensuring that water is of a sufficient quality to ensure the protection of endangered and threatened species” (Id. at 2745). EPA had previously stated, in promulgating a temperature standard protective of bull trout in Idaho, that “[p]rotection of optimal conditions is essential if a species is to be protected with an adequate margin of safety, and is also desirable because bull trout have been proposed to be listed as a ‘threatened species’ under the [ESA]. Maintenance of optimal conditions is considered important to the restoration of the population” (62 Fed. Reg. At 41169).

Consciously allowing the possibility of water temperature to rise above the optimal range would not be fully protective, is contradictory to statements presented in other sections of the draft guidance and previous statements by EPA, and would negatively impact species listed under the ESA. Numeric criterion need to ensure that the optimal temperature range will be achieved at all times in order to minimize adverse effects and translate to protection of beneficial uses.

➤ **Table 3. Recommended Criteria That Apply to Summer Maximum Temperatures** (pg. 23)

Regarding the narrative cold water refugia provision for lower mainstem rivers, the term “feasible” needs to be defined.

➤ **Table 4. Other Recommended Criteria** (pg. 24)

Defining bull trout spawning and salmon/trout spawning, incubation, and emergence from the *average* date spawning begins to the *average* date that incubation ends does not capture all spawning and incubation dates. This does not offer full protection of these uses. These dates need to be defined from the absolute beginning date to the absolute ending date with a margin of safety.

➤ V.1.2 Discussion of Use and Criteria Presented in Table 3 (pg. 25)

Salmon and Trout Juvenile Rearing and Juvenile/Adult Migration

EPA's recommended 18 degree C 7DADM criterion designed to "4) provide optimal or near optimal juvenile growth conditions....for most of the summer, except during the summer maximum conditions, which would be slightly warmer than optimal."

Again, this does not fully protect the use of rearing and migration (see comments regarding *Integrating the General Factors in Selecting Protective Criteria* above) and seems to contradict the purpose of focusing criteria on summer maximum temperatures. Targets outside the optimal range do not minimize adverse impacts and promote recovery of vulnerable fish populations.

Salmon and Trout Migration (with cold water refugia narrative provision)

Again, the meaning of "feasible" needs to be clarified.

➤ **VI.1. Adoption of Site Specific Numeric Criteria that Supports the Use** (pg. 29)

It is unclear how states and tribes will be demonstrate that an alternative numeric criterion supports designated salmonid uses. In reference to the temperature standards for bull trout in Idaho mentioned previously, EPA concluded that absence/presence data did not enable determination of criteria that would be protective without supporting information on population health. Provisions for supporting data that show full support need to be incorporated into this section.

The example in this section referring to situations of high natural diurnal variation where MWMT is within the optimal range but the maximum temperature may exceed standards should include a recommendation for narrative criteria for cold water refugia similar to that included with the recommended lower mainstem river criteria.

Again, we would like to thank you for the opportunity to provide our comments on the draft guidance. We appreciate the complexity of balancing the biological needs of aquatic species with a developed landscape. We look forward to a temperature guidance document reflecting the goal of protecting salmonids and other aquatic species in Pacific Northwest waters. If you have any questions regarding these comments, feel free to contact Jamie Davis in the Tribe's Water Resources Division at 208-843-7368.

Sincerely,

Samuel N. Penney
Chairman



Nooksack Indian Tribe Natural Resources Department

3891 Uluquance Drive * P. O. Box 157 * Deming, WA 98244
(360) 592-2632 X3211 Fax (360) 592-5753

November 27, 2002

Randall Smith, Director
Director, Office of Water
Environmental Protection Agency
1200 Sixth Avenue Northeast
Seattle, Washington 98101

Dear Mr. Smith:

RE: REGION 10 WATER QUALITY TEMPERATURE CRITERIA GUIDANCE

We appreciate the opportunity to provide input on the EPA's second draft of the Temperature Criteria Guidance. The document presents a clear mandate for management of water temperature to protect ESA listed species. EPA is to be commended for the extensive investigation into the temperature-related habitat needs of salmonids in the Pacific Northwest, and the incorporation of that information into these excellent Criteria.

As you are likely aware, recovery of Chinook salmon to harvestable levels is essential to the cultural and physical well being of the Nooksack Indian Tribe. The recovery of these species is one of our highest priorities, and as identified in the Criteria, appropriate water temperature provides an essential component of habitat in which chinook and bull trout can thrive.

Towards accomplishing the objective of attaining water temperatures suitable to support thriving chinook and bull trout populations, we offer these suggestions for modification to the Criteria proposed.

Eliminating the one-day maximum temperature criterion and relying on the seven-day average temperature (7DADM) criterion effectively relaxes existing standards, because the occurrence of detrimentally high temperatures will be obscured by the inclusion of both significantly lower daytime temperatures over the seven-day time frame. For example, over the period from 9/1/2001 to 9/30/2001, within the spawning period for South Fork Nooksack River early chinook, the 7-DADM was 14.3°C while the 1-day maximum was

16.9°C. Numerous technical studies have cited a maximum temperature of 14.5°C for spawning chinook¹.

More specifically, the recommended optimal productivity temperature for chinook juveniles is 10 to 15.6°C. Temperatures greater than 15.6°C significantly increase the risk of mortality due to warmwater diseases². The recommended seven day daily average maximum of 16°C cannot, then, provide conditions conducive to juvenile survival. The standard for Salmon/Trout "Core" Juvenile Rearing should reflect conditions known to promote juvenile survival; it should be reduced to 15°C, at a maximum.

With respect to the "Salmon/Trout Juvenile Rearing and Juvenile Adult Migration" standard of 18°C for the 7DADM and the "Salmon/Trout Migration on Lower Mainstem Rivers" standard of 20°C for the 7DADM (including the thermal refugia provision); the standards do not provide for successful migration of spring/summer chinook and bull trout. Migratory corridors are critically important to anadromous bull trout. distributions are thought to be limited at temperatures above 15°C³, and anadromous bull trout migrate upstream and hold during summer months. These Criteria fail to account for the fact that anadromous bull trout must migrate to the cooler temperature upper watersheds before they are able spawn there. Temperature standards must provide conditions that allow for that migration. The Criteria also fails to incorporate suitable protection for non-natal tributary rearing of sub-adult native char survival. It should be modified to protect these two critical life history stages; and should apply to mainstem and accessible tributary habitats downstream from the known migratory char population areas. Concerning impacts to chinook migration, McCullough states that when ripe adult females are exposed to temperatures above the range of 13.3 to 15.6 °C, pre-spawning mortality becomes pronounced, and the survival of eggs to the eyed stage decreases⁴. Again, these criteria are not protective of this life stage, and need to be modified to incorporate provisions for adequate protection.

The implications of different temperature regimes, and the associated statistical descriptions thereof (i.e. one-day maximum, seven-day average daily maximum, twenty one day average) to the productivity and survival of salmonids populations is complicated, but salmonid recovery can only be accomplished if temperature criteria (or standards) cover biologically relevant time scales, from minutes to seasons. We underscore the need for temperature criteria that encompass the one-day maximum temperature parameter, a 21-day average, as well as the seven-day average daily maximum. The Criteria proposed should be modified to incorporate the range of variability applicable to salmonid life stages.

Again, we appreciate the efforts that EPA has committed to the development of temperature criteria that promotes chinook viability and long-term salmonid population

¹ Hicks, M. 2000. Evaluating Standards for Protecting Aquatic Life in Washington's Surface Water Quality Standards Temperature Criteria, Draft Discussion Paper and Literature Summary. Washington Department of Ecology Publication No. 00-10-070, 176 pp.

² McCullough, Dale A. 1999. A Review and Synthesis of Effects of Alterations to the Water Temperature Regime on Freshwater Life Stages of Salmonids, with Special Reference to Chinook salmon. Prepared for the Environmental Protection Agency, Region 10 by Columbia River Inter-Tribal Fish Commission. 279 pp.

³ Federal Register Volume 63, no. 111

⁴ McCullough, Dale A. 1999. (as cited in footnote 2)

December 11, 2002

increases. EPA's incorporation of existing scientific data into the Criteria enhances our ability to promote the habitat needs of all salmonids dependent upon the water resources of Region 10.

Please do not hesitate to contact myself or my staff at the number listed above for any requests related to these comments, or any temperature data related to salmonid habitat in the Nooksack River watershed. Recovery and maintenance of temperature conditions essential to high-quality salmonid habitat is of the utmost importance to the Nooksack Indian Tribe.

Sincerely,

Robert Kelly, Jr.
Director

cc: John Palmer
Dru Keenan

John Palmer
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

Dear Mr. Palmer;

This letter presents the response of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) to the Environmental Protection Agency's (EPA's) Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. The Tribe appreciates the opportunity to contribute our perspectives in the development of this critically important water quality policy.

The CTUIR has its own EPA approved water quality standards and is currently working with EPA Region 10 on the development of an on reservation TMDL. Once approved the proposed Region 10 water quality temperature guidance will require revisions to the CTUIR's water quality standards. Therefore we have requested an opportunity to meet with you to discuss the changes that would be required. Because our meeting with you may provide us with important information about the specific impact to our tribe we have requested a brief extension of the comment period to allow CTUIR specific comments. As discussed with Dru Keenan, we appreciate the urgent need for this important policy to move forward as soon as possible, so we will work to schedule our meeting quickly. After meeting with you we will finalize our comments promptly.

Unnaturally warm temperature regimes in our rivers and streams are one of the most important problems preventing salmon recovery and degrading water quality in the northwest. It is imperative that science based plans to restore healthy temperature regimes be adopted and implemented as soon as possible. The tribe appreciates the effort that EPA Region 10 has undertaken to address this urgent problem and provide sound guidance on this issue.

"Salmon are in a state of crisis. We must act immediately and decisively if we are to save them from extinction and restore them. . . . Salmon have been a source of sustenance, a gift of religion, and a foundation of culture for our people since time immemorial."(*Confederated Tribes of the Umatilla Indian Reservation Columbia Basin salmon Policy*, March 8, 1995) In addition to being a cultural necessity for the CTUIR, the salmon populations of the Columbia Basin are natural resource treasures to the people

of the northwest region. It is long overdue for the federal, state and tribal governments of our region to adapt our laws, policies and communities to live in a sustainable and responsible manner that respects the needs of our rivers and our salmon.

It is EPA's responsibility under the Clean Water Act and its trust responsibility to Tribes to act now to protect and restore healthy temperature regimes to the waters of Oregon, Washington and Idaho. EPA has been late in doing this. Under no circumstances should a regional temperature policy be delayed any longer. Guidance such as the Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards is needed to guide revision of existing water quality standards. The current criteria for water temperatures in *Quality Criteria for Water* of 1986 may not be protective of vulnerable aquatic species in the Pacific Northwest when chronic and sub-lethal effects are taken into account.

Current versus Potential Use

The Tribe is pleased to see needed information and guidance dealing with the spatial reduction of salmonid habitat as a result of elevated water temperatures in the draft guidance. It is necessary to approach salmon habitat protection at a sufficient geographic and temporal scale to support sustainable levels of use. Due to the impacts of degraded water quality on current salmon distribution, protection and restoration of waters where there is reasonable potential for use to be restored is needed. This should apply whenever the current downstream extent of use is farther upstream than it was prior to habitat degradation. This guidance is needed to restore historic, expanded habitat that supports the protection and propagation of fish wherever attainable. This is especially crucial to the protection of treaty protected fishing rights. The ability of the CTUIR to exercise their treaty fishing rights depends upon the presence and abundance of fish throughout the Usual and Accustomed fishing areas. In addition it is necessary to recognize that the designated use must provide healthy and sustainable salmon populations.

Adoption of Regulatory Provisions to Protect Existing Water Temperature That is Colder than the Numeric Criteria

The CTUIR also supports EPA's call for adoption of regulatory provisions to protect existing water temperature that is colder than the numeric criteria as described in section V.2 of the guidance. These cold water protections are needed to maintain those remaining cold water refuges that provide important thermal complexity in aquatic habitats.

Restoration of alluvial (hyporheic) flows and temperature normalizing functions

The Tribe is very pleased to see EPA's acknowledgement of the importance of protecting and restoring shallow groundwater or hyporheic flows in restoring healthy water temperature regimes (page 26, 30 and 31). Shade, while an important component to temperature in many systems, is not always the most important factor in maintaining cool surface water temperatures. Research conducted by the CTUIR shows that in some systems shade can be demonstrated to not be the most important factor in the maintenance of healthy stream temperatures. The Tribe strongly supports the protection

and restoration of alluvial and shallow groundwater flows to restore salmon supporting stream temperature regimes.

Use Attainability Analysis and Numeric Criteria that Supports a “Marginal” or “Limited” Use

Section VI of the guidance deals with those situations where EPA’s recommended numeric criteria are inappropriate or unachievable. The science and strategies for implementing temperature reduction are new to the region and to EPA. Few if any comprehensive efforts have been made to actually implement temperature reduction techniques in an adaptive management basis which would provide the needed opportunities to learn over time from continuing efforts to reduce water temperatures. Yet this sort of prolonged and adaptive effort is what is needed to learn about the best solutions to high water temperatures. As a region we simply do not have much experience at understanding what works best to reduce surface water temperatures yet. For these reasons the Tribe believes it is too soon to focus on ways to compromise water quality protection. Until we have exhausted the possibilities for temperature reduction we must not give up on restoring water quality to fully support designated uses. The only exception to this may be circumstances where natural (not human caused) background conditions are warmer than the criteria.

The Tribe is concerned that too often alteration of numeric criteria is proposed as the mechanism for avoiding making needed temperature reducing improvements that may be unpopular to parties benefiting from their current levels of pollution. EPA’s required case-by-case review and approval of any proposed changes to recommended numeric criteria is crucial. The Tribe has participated in water quality temperature forums where Use Attainability Analysis and other approaches to lessening the requirements for temperature restoration were touted as the solution to regulatory obligations before exploration of possible temperature reducing strategies started.

Such an effort may be undertaken when either the numeric criteria or natural background conditions cannot be met due to human impacts that cannot be remedied or that would cause widespread economic and social impact if they were remedied (40 C.F.R. Part 131). Whenever states or other entities propose to alter numeric criteria to only support a “marginal” or “limited” use, it is EPA’s responsibility to ensure that the Treaty reserved rights of Tribal Governments are protected. EPA and states considering Use Attainability Analysis must recognize that the CTUIR and many other tribes currently experience substantial and widespread economic and social impact due to the current state of poor water quality, including lethal and sublethal effects to salmon populations. Salmon, which depend on healthy temperature regimes, are core to the culture and religion of the CTUIR and many tribes. In addition, salmon have always been and are today at the center of tribal economies. Substantial numbers of tribal members still depend on salmon harvest and trade to support their families. Any evaluation of the economic and social impact of remedying water temperature problems in the Columbia Basin must consider these facts.

The Tribe appreciates the opportunity to comment on the Draft EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. We believe that this guidance will significantly strengthen water quality protection in Region 10. I will contact you to schedule a meeting to discuss specific impacts to the CTUIR Water Quality Standards next week. Please feel free to call me (541-966-2357) if you have any questions about our comments. The Tribe looks forward to continuing our work with EPA Region 10 to restore water quality in the Columbia Basin. We thank you for your consideration of our comments.

Respectfully,

Kathleen Feehan
Water Quality Policy Analyst

cc: Sandra Johnson

State Agency Comments



DIRK KEMPTHORNE
GOVERNOR

November 26, 2002

Mr. John Iani
Administrator
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

**RE: State of Idaho Comments on Second Public Review Draft of Proposed EPA Region 10
Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards**

Dear Mr. Iani:

Attached are the comments by the State of Idaho on EPA's second draft of proposed new guidance on the development of temperature standards for water quality.

We believe the draft guidance contains a number of improvements from the previous draft, including the use of common metric for all criteria and the inclusion of natural background provisions. We appreciate EPA's efforts to address some of Idaho's concerns with the original draft.

However, we believe the second draft remains flawed in three major areas. First, we must make it very clear that optimal temperatures are applied only to core areas of a species range. Second, due to the substantial inter-annual variation in temperature, it is unrealistic to expect optimal temperatures to be met nine years out of ten. Third, the Idaho Department of Environmental Quality does not have authority to provide the protections you are requesting for waters colder than the criteria or to protect sub-surface flow.

Finally, it is vital that Idaho be able to apply the new criteria on the ground in the majority of cases, not resort to exemptions. We need address the adverse changes we have caused in water temperature, but we need to be careful that our efforts are not misguided, unworkable, or detrimental. We commit to working with EPA to ensure that temperature standards are sensible and attainable and are supportive of the guidance if the problems addressed above are corrected.

Sincerely,

A handwritten signature in black ink, reading "Dirk Kempthorne". The signature is written in a cursive style with a long, sweeping underline.

Governor

Enclosures

cc: Idaho Congressional Delegation
Idaho Natural Resource Agencies

State of Idaho comments on 2nd public review draft of proposed “EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards”

The proposed guidance contains several good points, but still suffers from a lack of bio-geographic reality. This unreality stems chiefly from the choice of species thermal preferences – the high end of optimum – as a standard for the natural environment, and applying it to the full extent of the use, even areas of potential use. It is as if all of Idaho’s waters are expected to be above average. We believe it is important to recognize that water temperatures vary widely in time and space, and that their natural condition is not always optimum. Indeed, examination of data from Idaho’s wilderness waters shows optimum water temperatures are the exception and not the rule. On the other hand, fish inhabit waters to the limit of their ability, not restricting themselves to optimum temperatures, e.g. bull trout in the Weiser and Little Lost River drainages.

As an example of the problem of applying temperatures fish would like to the real world, it is worth taking note of the Fish and Wildlife Service’s (FWS) recently announced proposal for bull trout critical habitat. In defining critical habitat, they use nine “primary constituent elements,” one of which is water temperature in the range of 2 to 15°C. During the regional criteria development effort, FWS representatives argued vociferously for a bull trout criterion of 10°C as a limit on maximum weekly maximum temperatures; the final guidance proposes a MWMT limit of 12°C. For streams this cold, annual maximum temperatures are typically about 0.5°C higher than the MWMT, so an equivalent annual maximum criterion would be about 12.5°C. Taking the critical habitat temperature to be an annual maximum minimizes the disparity, yet we have the FWS on one hand saying bull trout need habitat that is as warm as 15°C, and on the other hand EPA saying that when we recognize their use of the water it should get no warmer than about 12.5°C.

Clearly EPA recognizes the problem, for section VI of the guidance provides three methods to deal with situations where (or when) EPA’s recommended criteria are inappropriate or unachievable. Though not new, these are important provisions to truing up standards with reality, whether it is economic, social, or natural. What EPA fails to recognize is the extent the proposed criteria will be inappropriate in many geographic locations. In addition, EPA appears not to appreciate that it would be preferable to apply the proper criteria in the first place, rather than to correct expectations later. Because criteria are set in the range of optimum, we expect we will need to use “natural background” provisions frequently.

While the array of uses and criteria EPA proposes may bring some measure of bio-geographic reality, Idaho’s large low-elevation rivers will not meet the 20°C criterion for migration. This sets up the need for expensive and likely contentious

determination of natural temperatures to recognize the simple fact that fish use sub-optimal waters. We might avoid such senseless conundrums through additional use designations, if, in large rivers for example, the guidance allowed for brief seasons of non-use in the heat of summer. If EPA and the Services cannot accept periods of non-use, another alternative would be seasons of marginal migration, with corresponding higher criteria. This would be similar to what EPA proposed with core and marginal rearing, but would apply across time rather than space.

With regard to protecting water colder than criteria, Idaho agrees that preventing degradation is better than remedy of impacts. However, this needs to be balanced with economic uses of water and watersheds. For point source discharges into waters meeting criteria, Idaho presently limits temperature increases to 1.0°C. Additional authority to curtail these discharges will be difficult to obtain. Non-point sources are more problematic and we likely can justify further protection of water that is colder than criteria only where we can link it to meeting downstream criteria in the TMDL process. We also need to be careful that the burden for control of downstream sources is not unfairly placed upstream.

Idaho supports the following points in the guidance:

- ✓ The use of the seven-day average of daily maximums as a common metric for all criteria. This use of a “common currency” will do much to simplify water quality standards for temperature.
- ✓ Refinement of cold water uses provided by an array of five uses progressing from warmer to colder up a watershed. This can bring a good deal of geographic reality to many waters, though not all. It remains to be seen how sensibly we can do this, how limited our biological information may be, and how much our knowledge is questioned. If the process of use refinement envisioned is to go smoothly, it will be important that EPA work to streamline the process for approving changes to current designations.
- ✓ Division of salmonid rearing use into core and marginal categories is a major step forward. EPA should also split the migration use category into core and marginal.
- ✓ Using the average beginning and ending dates for seasonal uses such as salmonid spawning. This “trimming of the tails” alleviates some of the mismatch between selection of optimum criteria and their application.
- ✓ Recognition of the need for mixing zones is vital to practical application of any criteria. Without such a transition for temperature, we would be expecting to meet criteria at the end of the pipe, impossible without active chilling.

- ✓ Natural background provisions. Allowing for natural conditions is especially important for temperature, because unlike manmade pollutants, water temperature is often quite naturally not optimum. Natural heat loads and stream temperatures vary widely. Only added heat is a pollutant, and only increases in temperature a water quality problem, all that we can correct. High temperatures alone are not an indication of added heat. The lower criteria are set, the more often we will judge temperatures too high, irrespective of human additions of heat. Natural conditions will be the only way to straighten this out.

Idaho does not support the following points in the guidance:

- ✓ Applying high optimal criteria to all but unusually warm conditions. There is interplay between the value of criteria and the frequency we can expect streams to meet those criteria. EPA defines unusually warm as 1 year in 10. While this allows for some inter-annual variation in temperatures, it is unreasonable to expect streams not to exceed optimum 9 years in 10. With the above limitation, EPA correctly notes, “therefore, in most years, the maximum 7DADM will need to be lower than the numeric criteria” ... in order for the standard to be met. Examination of long-term USGS temperature records shows that the inter-annual range in the maximum 7DADM in most streams is 3-6°C, thus most years would be much cooler if the prescribed numeric criterion were met. Since high optimum temperatures have been prescribed, we believe an expectation they be met in all but the 1 in 4 warmest years is more reasonable.
- ✓ While acknowledging that the Endangered Species Act (ESA) confers no greater authority upon EPA, the guidance goes on to say EPA must “carry out” programs for conservation of species. This could be construed to imply EPA has some obligation to execute, administer, or enforce the ESA. We are concerned that the role of the Clean Water Act in recovery of endangered salmon is overstated. While change in water temperatures is a factor in species decline, it is but one factor. The best way to approach species recovery is in holistic habitat conservation planning efforts that take in all factors, and weigh trade-offs. Recognition of the role of the 4-H's (habitat, hatcheries, harvests, and hydropower) in the lower Snake is a good example.
- ✓ The statement on page 18 that, “When the mean temperature is near or above the optimum growth temperature, the ‘mid-point’ temperature between the mean and the maximum is the ‘equivalent’ constant temperature” raises questions. While the technical workgroup did discuss application of constant laboratory temperatures to the fluctuating regime of real streams, we never arrived at such a simple translation. What is the basis for this statement? Certainly such a translation is an area that needs more careful attention, and this is undoubtedly an area where more research is needed.

- ✓ The discussion of UAA's in section VI.3 stretches the application as described in 40 CFR 131.10. Our understanding and experience with UAA's is that they are for assessing attainability of uses, not *criteria*. On occasion we have been instructed so by EPA staff. If EPA now intends UAA's to be used for adjusting un-attainable criteria they need to be more forceful in stating so. They also need to be aware of the large number of approvals they are setting up for themselves. In recent history, Idaho is not aware of EPA region 10 ever making an approval of changes to state water quality standards within its statutory deadlines. Unless EPA is properly prepared for this situation, this seems wholly unworkable.
- ✓ The statement on page 17 that "The duration of exposure to near summer maximum conditions, however, can vary from one to two weeks in some areas to over a month in other areas" does not ring true. In our experience, the duration will more likely be in hours or days. Better definition of near optimum is needed, as well as a distinction between streams with large and small diurnal and seasonal temperature swings. In any event, this statement can and should be supported by data. We have attached an analysis of three streams in Idaho as an example of the supporting data that is available.

Attachment

Attachment to Idaho Comments on “EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards”

Analysis of time near summer maximum temperatures for three Idaho streams.

EPA’s 2nd public review draft of proposed “EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards” speaks to the duration of exposure to near summer maximum conditions as varying from weeks to over a month. Although EPA does not define ‘near’ maximum, this statement is probably not accurate, at least for most streams in Idaho. The duration of exposure to temperatures within 1-2°C of maximum is typically short, owing to temporal variation within a day, among days, and seasonally. Three example streams in Idaho are summarized below.

All three examples cover the time from June 16th through September 15th of 2001, the summertime when stream temperatures peak. The three streams were selected to cover a range of annual maximum temperature from 14 °C to 22°C and diurnal variation (near the summer peak) from about 2°C per day to 6°C per day. Additional examples can be provided.

Obviously how much time is spent near maximum depends on how near is near. Time within 1.0 and 2.0 °C of the annual maximum were examined here. This seemed reasonable since EPA is proposing limiting MWMT to high optimum temperatures. For streams just meeting the criteria, temperatures 1.0 to 2.0 °C cooler should be well within the optimum range. When one considers that EPA is further proposing that only 1 year in ten could be as warm as the proposed criteria, the exposure to temperatures ‘near’ maximum is indeed very limited.

Vanity Creek

Annual max. T = 14.0°C MWMT = 13.3°C for week ending July 6th July/Aug ave. T = 9.7°C

Diurnal range at summer peak ~ 6°C

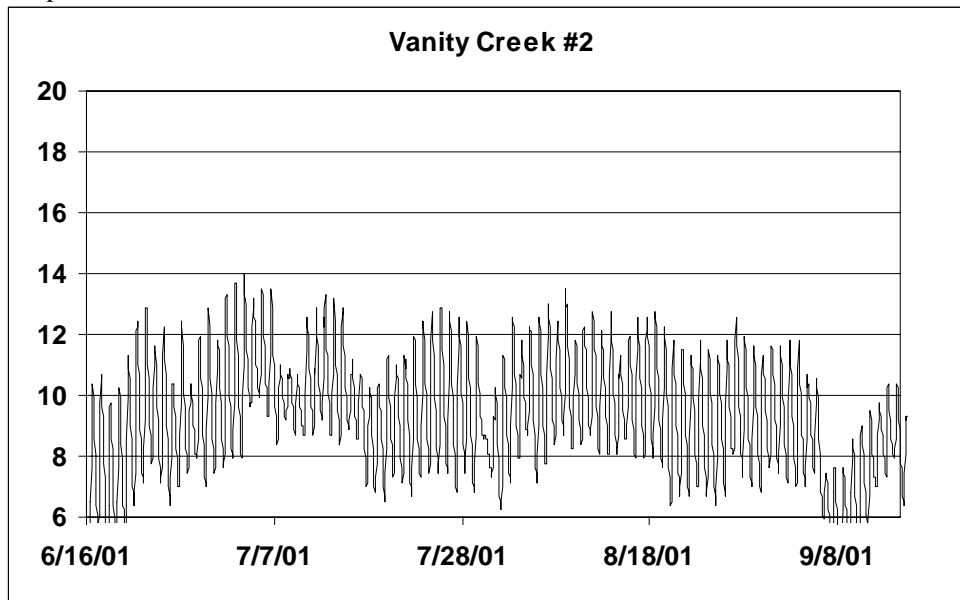
Time > 13°C (within 1°C of max)

	Greatest duration	Week centered on 7-3	Total 6/16 to 9/15
Hours (days)	5 hours	21 hours	27 hours
Date or % of time	7-3-01	12.5% of week	0.7% of summer

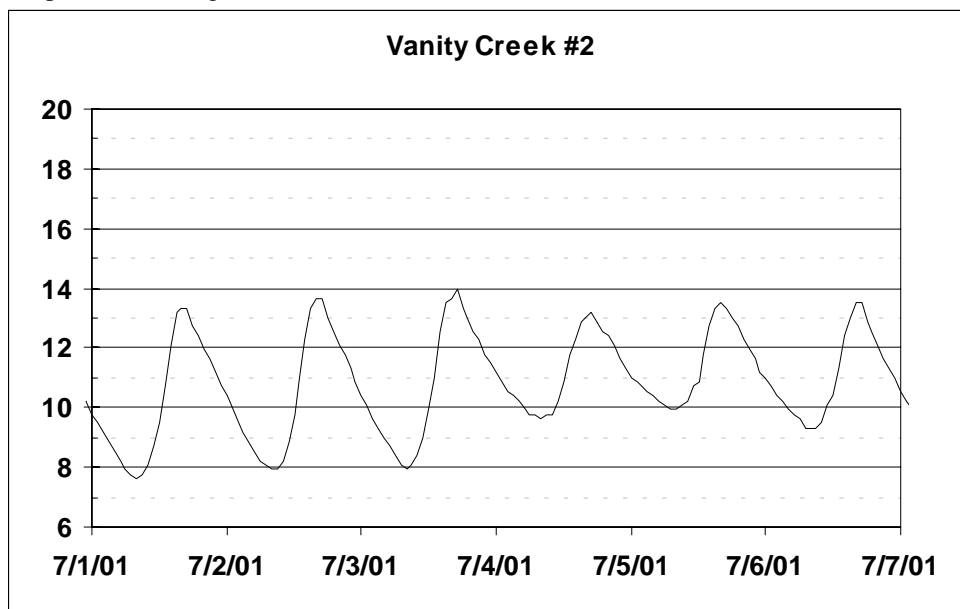
Time > 12°C (within 2°C of max)

	Greatest duration	Week centered on 7-6	Total 6/16 to 9/15
Hours (days)	7 hours	30 hours	155 hours (~ 6 days)
Date or % of time	7-6-01	17.9% of week	3.9% of summer

Temperatures over the entire summer



Temperatures during the warmest week.



Ship Island Creek

Annual max. T = 16.0°C MWMT = 15.5°C for week ending July 7th July/Aug ave. T = 13.2°C

Diurnal range at summer peak ~ 2°C

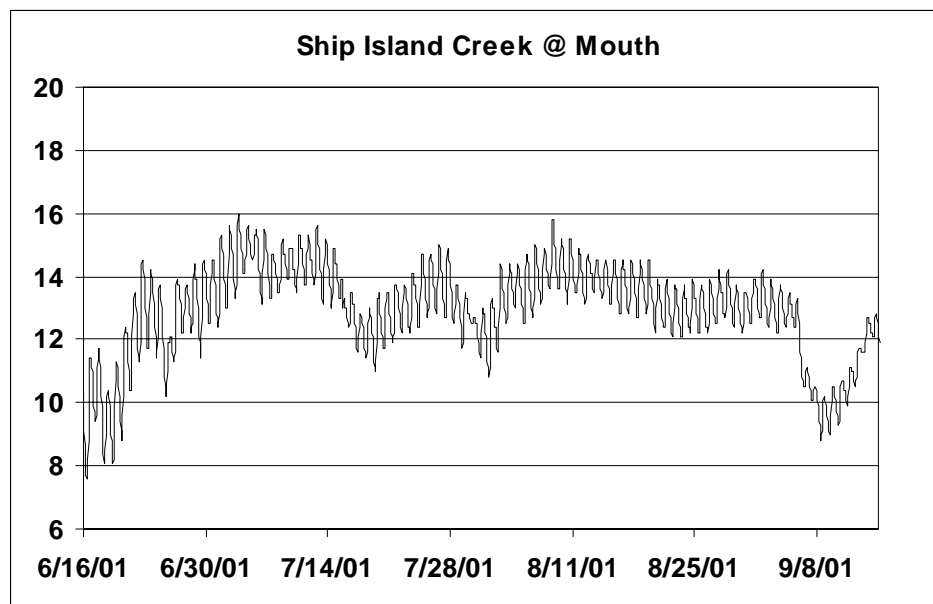
Time > 15°C (within 1°C of max)

	Greatest duration	Week centered on 7-4	Total 6/16 to 9/15
Hours (days)	11 hours	53 hours (~ 2 days)	84 hours (3.5 days)
Date or % of time	7-4-01	31.4% of week	2.1% of summer

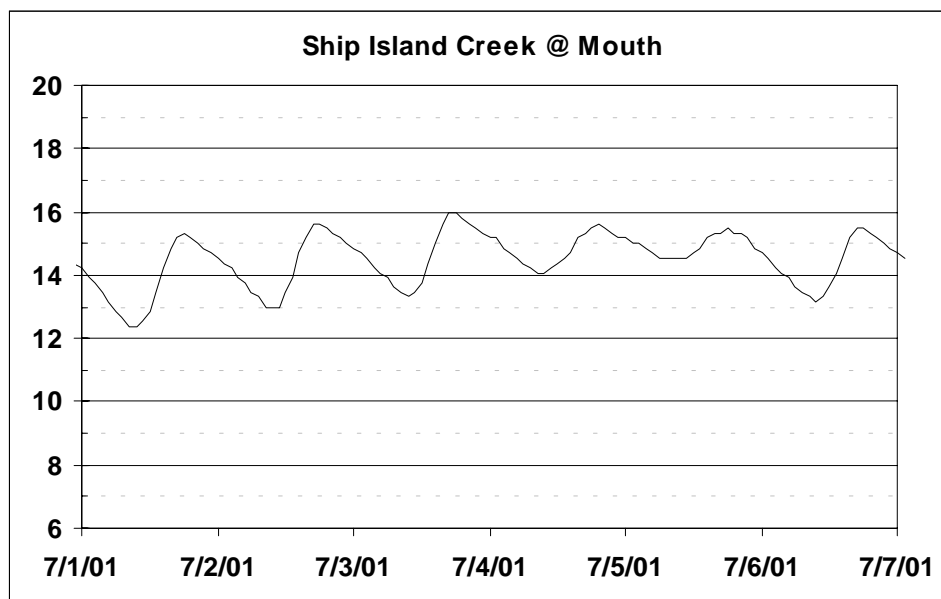
Time > 14°C (within 2°C of max)

	Greatest duration	Week centered on 7-4	Total 6/16 to 9/15
Hours (days)	64 hours (~2.7 days)	121 hours (~5 days)	427 hours (~ 18 days)
Date or % of time	7-3 to 7-5-01	72.1% of week	10.7% of summer

Temperatures over the entire summer



Temperatures during the warmest week.



Selway River above Running Creek

Annual max. T = 22.0°C MWM T = 20.7°C for week ending July 7th July/Aug ave. T = 16.7°C

Diurnal range at summer peak ~ 4°C

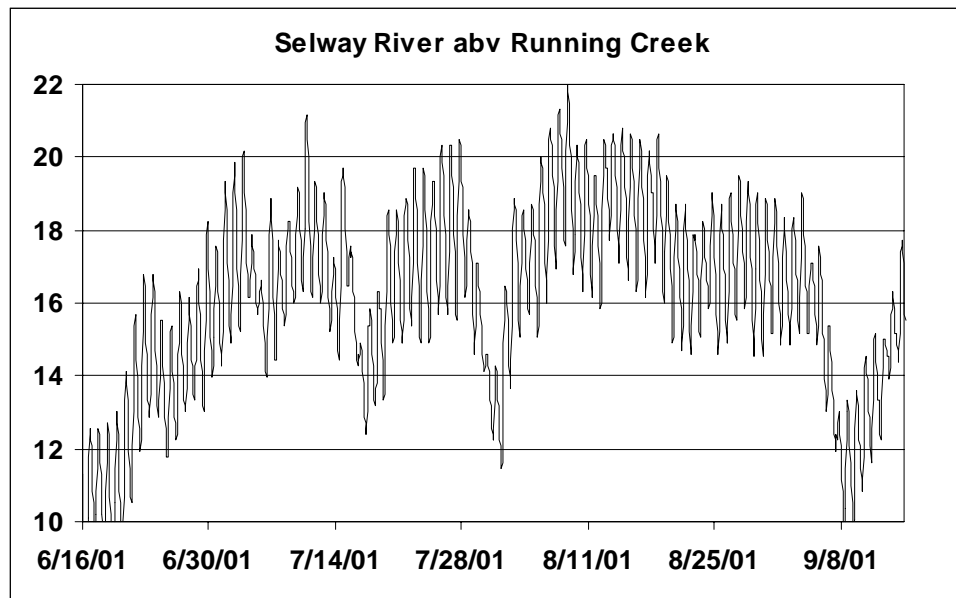
Time > 21°C (within 1°C of max)

	Greatest duration	Week centered on 8-7	Total 6/16 to 9/15
Hours (days)	6 hours	10 hours	10 hours
Date or % of time	8-7-01	5.7% of week	0.2% of summer

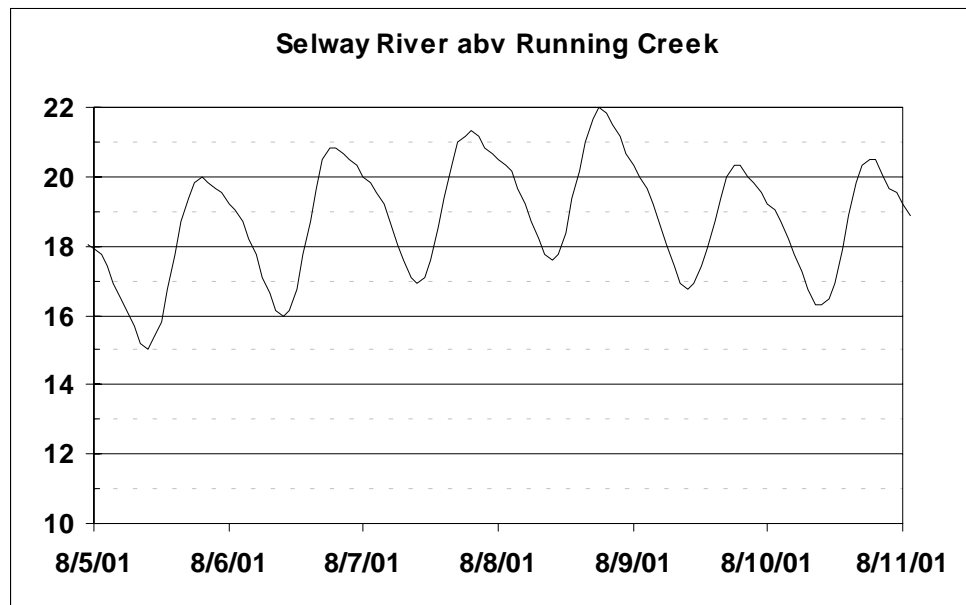
Time > 20°C (within 2°C of max)

	Greatest duration	Week centered on 8-8	Total 6/16 to 9/15
Hours (days)	12 hours (36 hours (1.5 days)	75 hours (~ 3 days)
Date or % of time	8-8-01	21.4% of week	1.9% of summer

Temperatures over the entire summer



Temperatures during the warmest week.



November 26, 2002

Randall F. Smith, Director
Office of Water
EPA Region 10
1200 SW 6th Avenue
Seattle, WA 98101

Dear Mr. Smith:

Thank you for the opportunity to evaluate the Second Draft of the EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards (October 10, 2002). Our comments reflect the views of all of the natural resource agencies of the State of Oregon. We very much appreciate the effort EPA is making to consider and balance the variety of views expressed by all of the interested agencies and stakeholders.

General Comments

In general, the second version of the guidance is well written and organized. As you will see below, Oregon supports many of the recommendations set out in the document. However, the overriding theme of our concerns is a question regarding the implementability of some of the key portions of the guidance. The feasibility of the guidance recommendations was identified as a critical evaluation factor early in the process. We do not believe the State and Tribal "feasibility" questions have been adequately addressed to date. In order to be useful, the guidance's recommendations must be technically credible and fit into our existing State water quality framework. The recommendations must address both point and nonpoint sources of stream warming.

We believe the guidance places too much emphasis on deriving a precise "one size fits all" temperature number, and not enough emphasis on short term strategies to preventing further warming and establish cooling trends. In an era of declining State budgets, it is important that we not spend significant resources trying to establish precise site-specific end points which are decades away from being realized. Instead we advocate that the guidance encourage effecting change "on the ground" as soon as possible. As our knowledge and implementation experience increases, the uncertainties associated with achievable temperature numbers will decrease and we will be better able to fine tune the final end point with more precision.

The guidance seems to assume that all State waters can reach optimal temperatures and places the burden on the State to carve out those waters that cannot do so. In fact, our TMDL experience suggests an opposite approach to be more appropriate. At present, we have identified only one watershed (the Hood) in the State that may reach these temperatures from headwaters to the mouth. Adopting the guidance would result

in the development of use attainability analysis (UAA) and site specific (less stringent) temperatures for virtually every subbasin in the State, including the Columbia River. We are confident that EPA does not intend for States to incur this extraordinary expenditure of public money when the result does not mean any appreciable increase in protection of temperature-sensitive fish. A far more fruitful approach would be to protect the natural thermal regime by limiting human alteration of stream temperatures. We suggest the guidance focus on the human contributions of heat rather than the biological needs of the fish; or better still, combine those concerns into one criterion as the existing Oregon framework does.

It would be very helpful if the final version of the guidance answered the following implementation questions:

- *What would be required for EPA to approve a TMDL?* (EPA has approved 12 Oregon subbasin temperature TMDLs. These TMDLs call for significant reductions in thermal loading and will drastically improve thermal and other aquatic habitat conditions).
- *How do the criteria apply to a point source when the ambient temperature of the receiving water is below the applicable criterion?* and
- *How do the criteria apply when the ambient stream temperature is above the criterion?*

In addition to clarifying how the recommended approach is intended to work, we feel compelled to point out that States and Tribes choosing to follow this approach will incur significant expenses in obtaining sufficient fish distribution and life stage information to appropriately apply the criteria. We will need significant Federal financial assistance to obtain this information in a timely manner. Similar assistance is likely to implement the natural conditions and UAA recommendations.

Finally, we strongly suggest that EPA obtain a thorough review of the final guidance from its scientific review panel and respond to their concerns and suggestions prior to issuing the document.

Specific Comments

Section V. EPA Region 10 Recommendations

DEQ agrees that important components of a water quality standard for temperature include:

- Appropriate beneficial use designations,
- A statement of water temperatures that are fully protective of sensitive salmonid life stages,
- A provision to protect important existing cold waters, and
- Mixing zone provisions to protect salmonids from short term acute impacts.

However, we are very concerned about the lack of options for dealing with the many streams in Oregon that would not be able to meet either the numeric criteria, or natural conditions; leaving us only with the option of doing a UAA and site specific criteria. The cost of this approach will be extremely high and take us down the path of trying to

identify the precise, appropriate site-specific numeric criteria in many locations across the landscape, rather than focusing our efforts on reducing anthropogenic warming.

There is still too much uncertainty about what thermal regime throughout a basin required to protect salmonid populations to say that nothing less than the natural conditions is protective, that if there is any human warming at all, the use is not supported and a UAA is required. There is still too much uncertainty to conclude that because a portion of a basin exceeds 18°C during the warmest hours of the day, during the warmest week of the year, that this will harm the population. What if some of the juvenile fish do not grow at their optimal rate during the warmest few weeks of the year? Does this harm them? Does it harm the population? What is the role of refugia? A standard based on natural conditions is an extremely stringent and costly goal. We believe that to request that States and Tribes adopt this as regulatory policy requires a solid body of evidence that it is really necessary to protect the use. To date, we are not convinced that this is the case.

The numeric criteria presented in the guidance are similar to those in our current standard in Oregon. But they are utilized differently. In the Oregon standard, when criteria are exceeded, human caused thermal loading is minimized but not absolutely prohibited due to the “no measurable increase” language. The other difference is that temperature management plans or TMDLs have to target the numeric criteria or “all feasible steps” to achieve the criteria, leading to system potential. The target is not absolute “natural conditions,” or pre-settlement conditions absent any human impact. However, it does result in targets that require dramatic reductions in anthropogenic heat loads and improvements in the thermal condition of our streams.

V.1. Salmonid Uses & Numeric Criteria

1. The recommended criteria in Table 3 are improved overall in the second draft. We support the need for sub-categories of salmonid use and seasonal uses based on species or life stage.
2. The phrase “may potentially occur” used in Tables 3 & 4 is too broad. It would be difficult to say for any location that there is absolutely no possibility that a salmonid could occur there. A suggested substitute would be something like “is likely to occur if habitat conditions are restored.”
3. If there is going to be a 16° criterion, we agree it should apply to “core” juvenile rearing and that 18° is more appropriate for application to the full extent of the range of rearing use. However, we are concerned about the cost and uncertainty associated with delineating where “core” rearing habitat occurs. More work is needed to describe how “core” areas will be delineated. Some additional possibilities include: 1) where estimates of thermal potential show 16°C is attainable and 2) where fisheries biologist identify “core habitat” based on best professional judgment and the best available information.
4. We prefer to keep the number of use categories and associated criteria to the minimum number necessary for the purpose of protecting the natural thermal regime and triggering the TMDL process where anthropogenic activity has led to unacceptable alteration of that thermal regime. Adding more categories than are required to accomplish that goal, makes the standard more complex, difficult and costly to apply but adds little marginal environmental benefit. We have this concern

over the 16° “core rearing” criterion and the 14° smoltification criterion for steelhead that would apply through May 31. These will add administrative cost and uncertainty to the application of the standard, but are not likely to provide significant added protection beyond application of the 13° and 18° criteria at appropriate times and locations together with the provision to protect existing cold water.

5. We support the inclusion of a 20° criterion for some reaches. We also agree that in these in warmer downstream reaches, cold water refugia has an important role for supporting fish use and we should to do what we can to protect and improve cold water refugia in these reaches. This guidance recommends that to apply the 20° criterion, a narrative on protection of cold water be required. However, there needs to be more discussion on EPA’s expectations for this narrative provision how it would be implemented.
6. We support the 90th percentile warm air temperature boundary condition for application of the criteria.
7. We support using the 7-day average of the daily maximum water temperature as the metric for the numeric thresholds.
8. There must be a reasonable method to translate from the constant or average temperatures that come out of laboratory studies to a 7-day average maximum criterion applied during the warmest week of the year in all but extreme warm conditions. In addition, as you point out, a criterion applied at the furthest downstream extent of the use will provide cooler water upstream.
9. While high temperatures exacerbate disease problems and we agree this should be avoided, it is not reasonable to reduce temperature criteria below the natural range of conditions in order to control disease. Disease should be a consideration, but should not be given the full weight of other indicators.

V.2. Protection of Existing Cold Water

DEQ agrees with the need for a provision to limit or in some cases, prevent the warming of reaches colder than the numeric criteria due to upstream/downstream effects. In addition, where watersheds have been warmed due to human activity, it is particularly important to protect remaining cold water reaches and tributaries.

V.3. Mixing Zone Provisions

DEQ agrees with the EPA recommendations in the second paragraph of this section for mixing zone provisions to minimize localized acute impacts to fish and to protect cold water refugia.

VI. Approaches to Address Situations Where Numeric Criteria Are Inappropriate or Unachievable

We are concerned that the guidance recommends establishing numeric criteria based on the upper end of the “optimal” range of thermal conditions and then applies those criteria to the full spatial and temporal extent of the range of use with very limited recognition of the fact that the uses will occur in many times and locations where the numeric criteria are not attainable. And with no recognition that some limited exposure to temperatures

above these criteria in some locations could occur with no measurable impact to the beneficial uses. In order to maintain our scientific and public credibility, there should be an explicit recognition within the temperature standard that these numeric criteria are not attainable at all times and places where the use occurs. The “natural conditions” rule and the UAA process are procedures outside the temperature standard itself and apply to all our water quality standards.

The EPA guidance has no allowance for minimal human use, such as “no measurable change” or a specified, limited allowable increase, as are included in the current Oregon and Washington standards. Rather, the guidance is based on the premise that water temperatures must be in the “optimal” range or at the natural condition, in order to protect beneficial uses. To base a water quality standard on the natural condition is a very restrictive proposal, saying essentially that there is no assimilative capacity for any heat load from human activity. We question whether this is indeed the case, that there is no room for any anthropogenic heat load, even “de minimus” or “non-measurable” increases. We believe that for EPA to make this claim, with the great associated cost, there should be made a better case that it is actually needed to protect the use.

The EPA guidance does not address how temporary impacts that may occur periodically should be addressed. For example, would it be prohibited under this guidance to do a project that involves removing streamside vegetation or grading of a steep cut bank and then replanting?

VI.2. Natural Background Provision

This section suggests that States use the natural background provision already in our rules to establish TMDL targets and allocations for stream reaches that we estimate can not meet the numeric criteria after all significant human impacts are removed. Yet EPA has agreed that the goal of the temperature standard is not to require restoration to pre-settlement conditions throughout the Northwest. We also do not believe that it has been demonstrated that this is required to support the beneficial use. Therefore, while this concept has some potential merit and usefulness, there needs to be more clarity about the definition of natural conditions and what will be required of States and Tribes to demonstrate that site specific criteria or TMDL targets are associated with natural background conditions. More work is needed to describe how this concept can be put into rule language and into practice in a way that does not cause unintended consequences.

The guidance should clearly state that temperature changes resulting from natural disturbance events such as wildfires, flooding, etc. are considered within the definition of “natural conditions” and recognize that, therefore, “natural conditions” will change over time due to these types of events.

VI.3. Sub-categories of Use to Address Human Impacts that cannot be Remedied

DEQ is greatly concerned that under the guidance, UAAs will be required in many locations where the use occurs. There will be many locations where neither the numeric criteria (based on optimal conditions), nor the natural conditions provision will be

attainable. Yet, neither the States nor EPA have any experience to speak of with UAAs, there is limited guidance and it will entail a very large public cost that produces no environmental gain. Most importantly, it may be a pre-mature concession of the ability of a stream reach to support the use.

We strongly suggest that EPA work through several examples of how the draft guidance would in fact play out when implemented through the various regulatory programs before recommending this path for all the States and Tribes in Region 10.

Again, we appreciate the opportunity to participate in this process and to provide our questions and comments on the draft guidance.

Sincerely,

Michael T. Llewelyn, Administrator
Water Quality Division

cc: Tom Byler, Governor's Office
Debbie Colbert, Water Resources Department
Ted Lorensen, Department of Forestry
Gregg Cline, Department of Forestry
Lori Sundstrom, Department of Transportation
Ray Jaindl, Department of Agriculture
Dave Leland, Health Division
Rick Kepler, Department of Fish & Wildlife

November 27, 2002

John Palmer
EPA Region 10
1200 6th Avenue
Seattle, WA 98101

**Subject: Comments EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards
2nd Public Review Draft, Oct 10, 2002**

Dear Mr. Palmer,

ODOT appreciates the opportunity to comment on the second public review draft of the Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. As an agency that will be directly affected by the implementation of temperature standards, ODOT is supportive of a guidance that will lead to consistent, reasonable standards that are developed promptly. This version is a clear improvement over the previous draft. Focussing on the requirements of the species of most concern and providing suggestions on how the standards should be applied to a stream system is much more useful than the previous draft's focus on mandating a complex and time consuming process for establishing standards. Most of our comments are therefore editorial in nature.

One issue that was not addressed in the Guidance was actions that result in temporary increases in water temperature. Highway projects often require the removal of shading vegetation. Mitigation by replanting, while potentially leading to a net improvement, does have a fairly long time lag before it becomes effective. These sorts of projects may be important for the public welfare, and cannot be cancelled because of a temporary impact on temperature, but safeguards must be in place to protect the aquatic resources. Guidance on what conditions must be met before temporary exceedances are authorized would be welcome. Specific comments are contained in the attachment.

If you have any questions or concerns, please contact William Fletcher @ 503.986.3509

Sincerely,

Lori Sundstrom, Manager
Environmental Services Section, ODOT

Attachment

Comments

EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards 2nd Public Review Draft, Oct 10, 2002

Page 3, paragraph 4, line 5: "Protective short term temperature exposure..." How long is the exposure period used to determine the upper incipient lethal temperature?

Page 6, paragraph 3, line 9: "Further, dams significantly reduce the river flow rate..." Insert "can" after "dams". Depending on how they are operated, dams can produce higher than natural flows during low flow periods.

Page 17, paragraphs 1 and 2: "...focus on the summer maximum..." and "...more temperature sensitive uses when and where they occur." The concept of using the summer maximum as the criteria focus in most cases seems reasonable. Where a more temperature sensitive use must be protected, we believe that the water quality standard be specific to the time and location, but not slop over beyond that. If actions taken to meet the more sensitive standard have the secondary effect of reducing the summer maximum that is a benefit to all. There are conceivable circumstances where seasonal control of particular activities may be needed, but which would not be necessary the rest of the year in order to meet the summer maximum criteria. This is implied in the paragraph, but could be made more specific.

Page 17 paragraph 3: Should reader assume that there is no duration component on the summer maximum (to the extent that it does not begin to affect more sensitive fall and spring uses)?

Page 17 paragraph 5 line 4: "...the 18°C and 20°C numeric criteria..." It is more understandable for the reader if the Salmonid Use is named instead of the temperature alone.

Page 17 paragraph 5 line 7: "The 20°C numeric criterion..." The should explicitly state that the relatively high temperature is acceptable where there are adequate cold water refuges. It seems that this criterion must be coupled with other components that specifically describe the quantity and quality of the refuges found in a river reach. The "natural thermal potential" aspect raises the specter of extensive modeling to determine what that might be. Any complicating factor that delays the development of a standard just leads to uncertainty and confusion.

Page 19 paragraph 1 line 7: "Thus, a given 7DADM..." ODOT agrees that there must be provision for unusually warm weather or other conditions. Will the 7DADM be adequate for streams with little diurnal variation? We would expect that it is, otherwise delays and extra

expense will result as state regulatory agencies try to adequately identify which streams are which.

Page 19 paragraph 2: Determination of attainment and exempt conditions. Basing attainment on 10 years worth of monitoring of water temperatures is unrealistic simply because the effort would be huge, and would not be done. It would be far more practical to use the air temperature trigger for deciding on exempt conditions, since it would be obvious at the time of stream monitoring whether or not an exception to the standard might be in order. However, there is at least one difficulty in defining exempt conditions, that being whether it should be defined by extreme high air temperatures for a short period, or by an unusually long period with high, but not extreme temperatures. Care must be taken when discussing the frequency of exempt conditions; like the 100 year flood, which can occur several years in a row, a 10 year heat extreme could occur several years in a row.

Page 19 paragraph 4: "Even provided..." This is a fairly tortured paragraph that states what should be obvious: that the 7DADM needs to equal or be lower than the criteria for all non-exempt years.

Page 20 paragraph 3 line 6: "...downstream extent of current use..." Insert "a specific" before "current".

Page 21 paragraph 1: ODOT agrees that having criteria set towards the warmer end of the optimal range is appropriate for the reasons stated.

Page 21 paragraph 5 line 4: "... (12°C) is available." Change "is" to "are".

Page 25 paragraph 3: Narrative cold water refugia WQS provision. This provision should define both what a refugia is (the temperature difference seems to vary with the use, 2-3°C for salmon migration, 4°C for bull trout juvenile rearing) and the size and distribution needed to meet the WQS. Requiring an action, as opposed to a defined goal, is a recipe for frustration and lawsuits. A related issue is what should be done if a stream segment is, for whatever reason, not amenable to refugia creation. Would the 20°C criteria still apply, or would a lower one be necessary to compensate for the lack of refugia? Would the criteria apply on reaches that usually have, or had before human interference, maximum 7DADMs below 20°C (which seems reasonable). If that is the case, then is there any reason to try to determine which rivers commonly hit 20°C (as opposed to those that naturally exceeded that temperature)?

Pg 26 para 3 line 10: "...extent that is if feasible..." Change to "extent feasible". Based on the previous discussions, there must be cold water refugia. The questions, for which guidance would be helpful, is where and how much. A vague "extent feasible" leaves the issue open for continual argument.

Page 26 paragraph 4 line 1: "...alluvial floodplain's..." Change to "alluvial floodplains".

Page 26 paragraph 5 line 1: "One of the reasons EPA is recommending a 20°C criterion in conjunction with the cold water refugia..." It seems that the wording here is backward; the refugia provision is included to direct attention to that issue.

Page 27 paragraph 2: "EPA's recommended 14oC maximum 7DADM..." Is it anticipated that this will be a seasonal standard? If so, will it be placed on all stream segments with spawning etc., or just on those where the summer maximum standards does not also lead to adequately low temperatures in the spring and fall?

Page 27 paragraph 4+: "Regulatory Provision to Protect Existing Water Temperature that is Colder than the Numeric Criteria". Protecting high quality waters is important for the survival of threatened species. At the same time, there may be circumstances where actions need to be taken for the public welfare that would result in small temporary or permanent temperature increases. The standards should allow for minor increases in water temperature (those that do not lead to exceedance of criteria) in cold water areas by a case specific exemption, and perhaps by identifying those areas in compliance where a minor increase would not result in impacts to either a beneficial use or result in downstream exceedances of criteria.

Page 30: "Natural Background Provisions". Not addressed in this section is the condition where anthropogenic influences can not reasonably be expected to be moderated or removed, and which result in exceedances of temperature criteria. These may have become the new "natural" condition. While this should not become an excuse for allowing anything to go, it should be recognized so resources are not thrown at an intractable problem, and instead are directed where they would do more good.

Page 30 paragraph 5 line 5: "...hyporheic..." Misspelling.

Page 31 paragraph 5 line 1: "The second circumstance is when...cannot be attained for some waters due to natural background conditions." One would assume that if the natural condition prevents attainment of the criteria, then those waters did not support the full salmonid use. The "beneficial use" protected by the water quality standards there should be whatever the use was (or could have been), instead of what we would like it to be.

Page 32 paragraph 2 line 3: "That is, if a UAA..." Demonstrating where in the upper watershed protective criteria are met would be pointless if the UAA natural condition would prevent upstream migration of the subject species.

Page 32 paragraph 4 bullets: Some of these bullets are indeed specific on-the-ground actions (1-3, 7), others are more complex actions that would require complex coordination

and diverse efforts to carry out (4-6, 8). The last two are goals, requiring policy changes and multiple actions. Specific comments on the bullets are:

“Reconnect...” This is complex, because it would probably require property acquisition and a large amount of construction. Liability issues arising from flooding of adjacent land could be expensive.

“Re-contour streams...” This would probably entail property acquisition. It also needs to be recognized that, to be properly functioning, the entire channel geometry must be appropriate for the hydrology and sediment load, not just the meander pattern.

“Increase flow in the river derived from...” Drop “derived from” and replace with “by promoting”.

“Discharge...” This needs to be seasonally appropriate.

“Lower reservoirs...” This would require policy changes and would result in other effects to the natural and human environment.

“Restore...” (both). These are goals, and give no clue as to how to do it, which is the challenge.

November 27, 2002

Mr. John Palmer
USEPA Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Dear Mr. Palmer:

Thank you for the opportunity to provide comments on the draft regional temperature criteria guidance. We applaud the effort you have made to respond to the public comments made on the previous draft. The current version represents a very positive step forward. Although Ecology has participated on both the technical and policy workgroups that provided technical support and input to the draft guidance, there are several remaining areas where we believe a different approach would be preferable and would still be protective of aquatic species. While EPA acknowledges that states are unlikely to develop and submit temperature standards that exactly match the guidance, it is still a worthy goal to attempt to minimize the potential for future discord to whatever extent possible. It is in the spirit of trying to further close the gap that still exists between the states and the current draft of the temperature guidance that we offer our comments.

Since we have been engaged in the debate in both the technical and policy work groups over the last three years over the specific numeric criteria values to be recommended, you are quite aware of our different interpretations of the available scientific information. We do not believe it will be productive to provide additional lengthy material here regarding the merits of individual numeric criteria. Rather, since our disagreements regarding specific criteria values appear rather minor in magnitude, our written comments are for the most part focused on policy and implementation issues. When Washington's draft rule goes out for public review, we will submit the technical discussion document that demonstrates where alternative criteria values should also be viewed as fully protective of our state's aquatic resources.

Summarizing our concerns with the guidance:

- States and tribes need better defined Endangered Species Act assurances if they adopt the guidance, or adopt programs closely matching the guidance.
- The exemption for unusually warm weather needs some refinement and closer consideration.
- Bull trout criteria should be applied only to core habitat or to spawning streams only, rather than to the furthest downstream extent of the use.

Mr. John Palmer
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November 27, 2003

- More guidance is needed on what constitutes core salmon rearing habitat and on how to determine whether the historic distribution has been reduced.
- The requirement to apply the 16°C salmon criteria in apparently degraded downstream habitat will require its use in the lower mainstem rivers although these are also those most affected by human impacts.
- The lower mainstem river criterion of 20°C for salmon is questionable biologically and is not reflective of how warm these waters naturally can get. Combined with the requirement to restore refugia this category of protection may be unworkable.
- Separate spawning criteria create a much more complicated standard without providing significant on the ground improvements in biological protection.
- Smoltification criteria will rarely be needed to protect this life stage, but will greatly increase the costs of developing TMDLs and permits.
- Natural background provisions should clearly allow for additional de minimis levels of human warming. It should not be necessary to adopt natural background temperatures as criteria in state standards.
- EPA should work with the Region 10 states and tribes to develop efficient and effective Use Attainability Analysis guidance. The temperature guidance should only broadly describe this important tool and reference the federal regulations.

Thank you once again for the opportunity to help in developing this important regional guidance. The protection of healthy thermal environments for fish and other aquatic life is very complex and appropriately controversial. We hope that you will carefully consider the comments that we are providing and make changes that will enable us to better support the use of the guidance recommendations in our state standards. If you have any questions please let us know. As always we will be happy to meet with you to help better explain our position and discuss what we view as more viable alternatives.

Sincerely,

Megan White, P.E., Manager
Water Quality Program

MW:DP:kh
Enclosure

Comments From the State of Washington on
The 2nd Public Review Draft of the
USEPA Region 10 Temperature Criteria Guidance

November 26, 2002

The following comments are provided in the order in which the topics occur in the guidance document and do not reflect a prioritization of concern.

Approval in Advance by USEPA, USFWS, and NOAA-Fisheries

We understand that the federal agencies cannot agree in advance of the fact that a state or tribe adopting water quality standards that follow the guidance will be unconditionally approved under both the federal Clean Water Act and the Endangered Species Act. However, we also believe stronger programmatic support for the guidance should be placed in writing both in the guidance and in letters from the regional administrators of the respective agencies to their regional and state offices. This support should include at a minimum clear validation that the criteria values themselves, if properly applied to the locations where the fisheries uses occur and at the times of the year they occur, should be viewed as supporting the goals of the applicable acts.

We recognize that this still would not provide the states with a guarantee of approval, but it would appropriately focus the federal reviews on the “when and where” questions, and not engender further debate on the temperature criteria values. Asking states to adopt cooler criteria than may be necessary to protect the aquatic environment without providing better federal support does little to encourage voluntary use of the guidance.

Better clarification of the precautionary nature of the recommendations is also needed. Such clarification is needed to ensure that minor differences between the guidance recommendations and criteria adopted by the states do not require high levels of justification on our part.

Exemption for Unusually Warm Conditions

As Ecology has explored the concept of exemptions for unusually warm conditions, several potential problems have surfaced that may be relevant to EPA’s final guidance. Ecology supports the recognition that a probability reoccurrence interval of “once every ten years on average” is both reasonable and a good idea. However, a statistical reoccurrence interval as used currently to set reasonable worst case permit limits and TMDL targets is very different from language that just says you can violate the criteria

once every ten years. States do need a statistical reoccurrence interval to avoid basing control limits on models set for absolute worst case assumptions of air temperature, water flow, and discharge quality. By having a probability frequency, we can be more reasonable in setting limits while still targeting full compliance with the criteria.

In previous years Ecology also considered the Oregon approach of waiving the criteria when the annual average 90th percentile air temperature values were exceeded in an area. What we found was that the periods of maximum air temperature did not directly correspond with the periods of maximum water temperature in either space or time. The warm water period is generally after the peak air temperature period, rather than during it. Additionally, in large rivers the 90th percentile event-warmed waters continue to contribute to compliance problems in downstream waters that have not exceeded their 90th percentile events.

A final issue that we want to make sure you have considered is cumulative allowances for exceeding the criteria. Permits and TMDL targets will continue to be based on compliance at a 7Q10 flow, thus any non-flow exemption may have the unintended result of sometimes doubling the allowable frequency to which criteria can be exceeded. EPA should be sure this is an acceptable outcome before the guidance is finalized.

Bull Trout Juvenile Rearing

Ecology is concerned that EPA and the federal fish agencies have selected criteria values that are slightly too cool to represent the upper threshold for full protection of char rearing. Our analysis suggests that the 7DADMax should be between 12.5 - 14°C and would most defensibly be set at 13°C. While the guidance recommendation seems to be very similar to our proposal, differences as small as 0.5 - 1.0°C can make a significant difference in compliance rates at such low temperatures. Waters out of compliance will require TMDLs, the costs and complexities of which we would like to avoid if not necessary to provide healthy thermal environments for char.

Ecology is even more concerned with the apparent broad application intended for the proposed 12°C threshold. At the very least, the guidance should state that the 12°C value is intended to apply to core areas used for the early rearing of char – not to the furthest downstream occurrence of rearing. We need to discourage the potential for future demands that we apply 12°C criteria in the lower portion of rivers based on use by migratory fish or speculative use by young juveniles. Ecology has proposed a system for applying char criteria that focuses broadly on the types of waters used for spawning, recognizing that the general pattern of char rearing is concentrated in these waters as well.

The EPA guidance should acknowledge this approach, at least broadly, and should be more clearly focused on first year juveniles. This will ensure that application of the criteria will be in the headwaters where the evidence supporting the need for very cold water is strongest, yet will allow application in areas downstream of spawning sites if early juvenile rearing is properly documented.

Ecology supports the decision not to include a separate migratory criterion at this time, and also supports revisiting the issue at a later time if sound science demonstrates this life stage is not being adequately protected from an ecological context.

Salmon/Trout “Core” Juvenile Rearing

EPA should make it abundantly clear that 16°C is not protective of incubation directly, but that with early fall cooling temperatures will in most cases decline to levels that are protective. The existing discussion is not clear on this point. The guidance should also clarify that by considering cumulative effects, the application of 16°C at the lowest end of the core rearing area will ensure that much of the upstream waters are actually cooler than 16°C.

EPA needs to provide more direction for how the states can consistently determine where to apply this criterion. What level of degradation should be considered to have resulted in a shrunken distribution? Are you referring only to thermal degradation? What change in density typically signals a change from core to marginal rearing habitat? Can some narrative measure of habitat frequency or quality be included to help guide the definition of core areas based on habitat features?

Salmon/Trout Juvenile/Adult Migration

The allowance for an 18°C threshold is most needed and appropriate in downstream waters, yet these downstream waters are those that have also experienced the greatest levels of degradation. We interpret the guidance to state that if these lower reaches are only “minimally degraded” the 16°C threshold should apply, perhaps all the way to the mouth – rather than being able to apply the more appropriate 18 or 20°C threshold in some cases. This accentuates the need for guidance on how to determine where to apply the temperature thresholds. Such guidance should be made a part of the total temperature guidance package.

Salmon/Trout Migration on Lower Mainstem Rivers

Selection of the 20°C temperature criterion appears to be based less on biological thresholds and more on a policy decision to have some option for applying warmer than optimal temperatures to mainstem rivers. While this policy position is understandable, 20°C may not be healthy biologically nor does it necessarily represent the region’s warmest rivers. For example, where information shows a water body would likely have a maximum temperature of 22°C, assigning 20°C will not be reasonable from a regulatory standpoint. And where information shows a water body would likely have a maximum temperature of 18.5°C, allowing it to be warmed to 20°C would not be reasonable from a biological standpoint.

EPA should be very cautious of departing from the historic practice of setting fully protective water quality criteria. There are other available mechanisms provided in the

federal rules to assign both biologically, socially reasonable and physically attainable water quality criteria. In most cases of waters with higher temperatures we will end up having to develop a TMDL that determines a different target than either 18 or 20°C, develop a UAA to modify the use, or assign variances to specific activities. EPA should focus its resources on making these tools more dependable and predictable for states to use. At present, confusing policy directives have created nationwide doubt regarding the validity of these authorized tools. The directives on the use of UAAs contained in this guidance unfortunately may serve to perpetuate such problems.

The EPA guidance tries to mitigate the lack of full protection provided by a 20°C criteria by requiring that thermal refugia be restored and protected as a precondition for being able to use the criterion. We certainly recognize the importance of refugia, but believe this condition may make actually assigning the criteria to specific waters prohibitively difficult. At the very least, EPA should demonstrate how this protection would be applied in the Columbia River where a joint federal and state project is currently completing a TMDL that shows the temperature was naturally above 18°C – how would this guidance be applied to that situation?

Most of the causes of lost refugia are not controlled by the state agencies assigned to implement the Clean Water Act, so the demonstration should also carefully describe what is intended to be viewed as “feasible” in recognition of the limitations of agency authority. What levels of confidence would be associated with this determination? Is it enough to have a theoretical possibility of assisting with refugia restoration or formation, or can states only consider efforts that would have a clear likelihood to create areas of refugia?

Alternatively, the language should be less prescriptive on the need to take all feasible steps to restore and protect the river functions that provide cold water refugia. Requiring that “agencies should examine where they have opportunities to restore and protect thermal refugia and modify their regulations appropriately” would be a more real-world way of addressing this issue. As a last suggestion, EPA should consider retracting this mitigation clause entirely until it has developed defensible methodologies in advance for states to use to identify, protect, and restore such habitats.

Bull Trout Spawning

There are several problems with the guidance directive to assign spawning criteria for char spawning. The first is that EPA has selected a value that is not well correlated with the findings of the technical literature. The second, and a related issue, is that EPA has not provided any data that supports the assertion that meeting the 9°C criteria will allow favorable incubation temperatures. We also question whether it is reasonable to set stream-wide criteria for a species that is well known to be very selective in its use of ground water upwelling areas for its spawning. The use early in the fall of thermal refugia for spawning should not obligate the state to assign such a cold criterion to the entire stream.

With the above technical questions still not well resolved, we are not supportive of adding complexity to the standards, permitting, and TMDL processes by having different criteria that must be applied at different times of the year, and of the necessity to debate and defend assumptions on where and when spawning occurs in a basin. Given how little is known of char spawning areas, assigning the 9°C criterion will be technically problematic and very controversial.

We therefore recommend that only the summer rearing number be required. If EPA believes it must include some recognition of the spawning requirements of char then it should be in the form of a recommendation that states monitor their char waters to ensure that suitable temperatures generally occur at the sites known to support early season spawning.

Salmon/Trout Spawning

Ecology is very concerned with the added costs and complexity associated with having different temperature criteria for rearing and spawning. This will complicate the process of developing TMDLs and permits. It does this by requiring that modeling and permitting programs assess two different critical periods (e.g., modeling under different flow and stream shading assumptions) for compliance, and will likely increase the workloads through the inevitable debate that will occur regarding the selection of spawning area boundaries and time periods.

Our examination of water quality data suggests that the majority of water bodies in our state that have summer 7DADMaximum temperatures between 15 - 16°C will meet the 13°C spawning temperature at the time spawning typically occurs in those watersheds. Given the high degree of compliance just focusing on the summer temperature, we feel the added costs and complexity of separate spawning criteria are unwarranted. As suggested above for char spawning criteria, a more acceptable alternative would be a narrative directive for states to monitor spawning sites used in the early fall or late summer to ensure that suitable temperatures generally exist when spawning occurs.

Steelhead Smoltification

Ecology can find little justification for the complexity caused by adding a spring out-migration criterion, and we strongly recommend that it not be included in the guidance. Our data suggest that spring temperatures would rarely be out of compliance with a 14°C criterion. Monitoring in the spring is also characteristically the most difficult and dangerous time for our staff. High flows make deploying and recovering thermistors very problematic.

Establishing a spring criterion for out-migration would also require us to model and estimate critical conditions for perhaps three different seasons, would result in high failure rates with deploying and recovering temperature recording equipment, and put field staff in dangerous conditions to guard against temperature problems which would seldom occur.

If EPA retains these criteria, it must be more specific on the how the criteria are intended to apply. What percentage of the outgoing run is to be covered by the criteria (75%, 90%, or 99%)? Is this a typical out-migration pattern or worse case assessment of out-migration timing? Where does it apply in rivers that are not major tributaries to the Columbia or Snake Rivers?

Adoption of Mixing Zone Provisions to Protect Salmonids

As requested previously, Ecology would like to review the technical foundation for the statement that water temperature changes of greater than 8°C, regardless of the specific temperatures involved, cause an increase in predation due to shock. Further, we disagree that it an absolute temperature of 21°C creates a blockage to migrating fish, although we do agree that the risks increase and that a temperature of 21°C is not healthy for migrants. We suggest that some recognition of the temperature differential experienced by migrating fish be included. Fish acclimated to 2 - 3°C cooler water may indeed experience blockages trying to enter water of 21°C or more, but fish moving through 20°C and encountering 21°C are unlikely to stop their migration. We would be interested in any evidence that you are aware of that contradicts our assessment.

Site Specific Criteria that Supports the Use

We support the ability to develop site-specific criteria, but find the examples provided troublesome. The 12°C char rearing criterion is not clearly linked to competition, it is not clear what species of competitors it excludes, and it is not clear how the state would demonstrate that competitors would not occur if the water was warmed to 13°C. Thus it is hard to imagine how an impartial science-based review of such a site-specific criterion would occur.

The second example is similar. The relationships between effects at various levels of fluctuation are not well established in the literature and were a subject of debate among the technical workgroup members during the development of the EPA guidance. We would suggest a state or other entity would likely need to do original research on this issue. Although conducting research is a normal course of action for developing site-specific criteria, we suggest that to override the body of literature used to develop the EPA guidance would require considerable effort. This is not to suggest that it should be easy to override established criteria, but only to suggest that the language in the guidance makes it appear to be so.

As a state that has developed site-specific criteria, we are very aware of the scrutiny and high burden of proof associated with such efforts. If EPA is lowering the bar for establishing alternative temperature criteria then perhaps that fact needs to be clearly stated. If not, then a general statement on the need to show that the species at the site would be fully protected at some alternative level is both sufficient and most appropriate.

Use of Natural Background Provisions

States must be able to allow some low, de minimis level of warming both when natural conditions cause temperatures to warm above the water quality criteria and when irreversible human effects (alone or in combination with natural conditions) cause temperatures to be above the water quality criteria. Even though at least one Region 10 state uses the phrase “no measurable change,” it appears to us that all states are actually basing their allowance primarily on the concept of some level of de minimis effects.

We view such an allowance as “an amount of warming that is below field detection limits is certainly de minimis.” From a policy point of view (especially when contained in federal guidance) there is a very different connotation created by the phrase “no measurable human change above natural levels should be allowed.” Detection limits are constantly changing, and modeling can estimate temperature changes to one-thousandth of a degree. In combination with a mixing zone, allowance of a 0.3°C de minimis level above naturally warm temperatures allows for significant economic mitigation without causing more than a minimal level of further degradation or risk to the biota. If technology were to change this to 0.1°C or 0.05°C this would negate its social value. The guidance must clearly support the practice of states allowing a de minimis increase in degradation above naturally warm temperatures (and above any irreversible effects caused by major structural changes such as dams).

A second issue of concern with this section is the apparent requirement to adopt some alternative “natural condition” temperature value into state water quality standards. Modeling is not accurate enough to justify selecting a specific value and going through the considerable expense of adopting it as a water quality criterion. This is why EPA through its TMDL branch has begun to formally acknowledge the use of TMDL estimates more as interim targets that may be refined at some point in the future. As modeling techniques improve and as restoration reduces the proportion of the estimate that must be based on speculative prediction, future analyses may find that the real system potential is very different than that originally predicted.

For human impacted systems modeled to remove human influences, or even wilderness streams that are above the criteria, there is an added problem of selecting a specific criterion to represent its condition. For naturally warm streams without human influences, it would require many years of monitoring to allow a scientifically accurate estimate of its maximum 7DADMaximum temperature having a reoccurrence interval of once every ten years. In addition to being a poor requirement due to existing technological limitations and causing unproductive resource expenditures by states, we will often not need to know exactly what the natural temperature is to effectively provide the intended level of protection. Modeling can focus on the incremental load that is allowed (a cumulative 0.3°C) with high precision without knowing exactly what the natural temperature would be (e.g., 21.4°C versus 23.2°C).

Thus the guidance should clearly allow states to permit de minimis increases above naturally warm or irreversible human effects levels, should not appear to require the

adoption of a criterion value into state water quality standards, and should clearly acknowledge that it is acceptable for states to focus on meeting the de minimis allowance without first determining a specific natural threshold temperature. It would be appropriate and advisable to recommend that the field detection limit of 0.3°C be considered in selecting a de minimis value. EPA should of course be clear on whether this value would be best applied for each individual source or cumulatively to the waterbody. If applied to individual sources some alternative cumulative limit should probably be recommended as well (e.g., 0.5-1.0°C).

It is very important that EPA recognize that requiring states to adopt natural condition temperatures as water quality criteria by regulation in each case where conditions are warmer than the biological criteria is completely impractical and will lead to a lack of support for the state standards.

An additional feature of this part of the guidance is the directive for states to pursue ways to capture the effects of restoring alluvial river segments and the associated hyporeic flows in their estimates of natural background conditions. Such concept-heavy cutting edge considerations should not be casually included as recommendations to states and tribes. EPA should develop the tools necessary to defensibly model these effects in advance of directing states to incorporate them into their ongoing programs.

Use Attainability Analysis and Numeric Criteria that Supports a “Marginal” or “Limited” Use

Making the UAA process an efficient and effective tool for states to rectify situations where uses have been inappropriately assigned is necessary to prevent further erosion in the support for state standards and their related programs (e.g., TMDLs and permitting). We would like to work in partnership with Region 10 to develop more comprehensive guidance for developing and using Use Attainability Analyses to set alternative levels of protection. We therefore request that EPA consider eliminating the section on the use of UAAs from the temperature guidance. In that case only a general statement should be included that acknowledges UAAs are a federally approved tool for states to use in setting alternative levels of protection.

We offer the following comments on the existing discussion on UAAs as an advance on what will hopefully be a more collaborative and thoughtful effort to develop regional UAA guidance that would apply to more situations than just the application of temperature criteria. The guidance suggests UAAs are most appropriate to lower mainstem waters, but dams and diversions, in particular, occur in upstream environments as well. Guidance that points to the lower mainstem will be taken by many to mean that UAAs in upstream areas are not appropriate even though human structures are present that affect aquatic uses.

UAAs should not require that a specific temperature value be calculated, as thermal protection could equally be provided by narrative statements preventing further or more than de minimis effects. The guidance should not suggest than any temperature warmer

than the recommended fully protective criteria is “marginal” or “limited” in its protection. This overstates the situation that may occur in many of our waters where we would expect temperature criteria to be exceeded by only a very slight margin. (0.5 - 1.0°C). It should be quite acceptable to set an alternative target, either numeric or narrative, while retaining the original use designation (e.g., salmon rearing).

Similarly, a state should not always need to conduct a UAA just because natural conditions prevent full compliance with a numeric criteria designed to provide near optimal protection for a use. A TMDL that sets an alternative compliance target should not necessitate either adoption of an alternative criterion value or necessitate changing the use designation. It appears you may be establishing a new 303(d) listing policy for temperature in the guidance, and we want to be sure that we understand what you are suggesting. It appears that you are authorizing states and tribes to not list waters on their 303(d) lists for violating numeric water quality criteria until they have conducted both a TMDL and a UAA. If that is not correct, then you should consider alternative wording.

The Role of WQS in Protecting and Recovering ESA Listed Species

While the list in the guidance of ways that water temperatures and thermal habitat can be improved is fine as general examples, this section gives the mistaken impression that these corrective actions have some direct relationship to the authorities of states under the federal Clean Water Act. State agencies cannot return otherwise legally appropriated water, determine if floodplains will be developed or abandoned, set zoning to allow for fully operational channel meandering, require citizens to reconnect old meanders, etc. We strongly suggest this section be changed to simply describe ways to improve and protect thermal habitat.

Federal Agency Comments



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

1387 South Vinnell Way
Boise, Idaho 83709

In Reply Refer To:
7240 (931)

November 26, 2002

Mr. John Palmer
Environmental Protection Agency, Region 10
1200 6th Avenue
Seattle, Washington 98101

Dear Mr. Palmer:

Thank you the opportunity to comment on the Second Draft of Regional Water Temperature Guidance.

First, we suggest the title reflect that the guidance only applies to water bodies with fish listed as endangered or threatened under the Endangered Species Act. This would clarify those areas where the guidance is applicable.

We were disappointed that the second draft moved away from the method of establishing water temperature standards by defining the thermal potential of water bodies. Although establishing criteria for water bodies using the thermal potential is more complicated, it was aligned more closely with the range of natural temporal and spatial variability that exists in nature. The establishment of a single standard flies in the face of the body of scientific evidence for the temporal and spatial variability of waters. For example, the Selway River and the Middle Fork of the Salmon will not meet these guidelines because they have little disturbance that causes temperature increases. This will cause the State of Idaho to prepare some type of document to try to justify a lower temperature standard. Until that is done, these streams will be out of compliance. When standards that cannot be met are applied, the entire body of science that went into developing the standards is brought into question, particularly by the public.

We question whether the Clean Water Act (CWA) authorizes using the “near optimum” conditions described in the draft guidance. The CWA requires that the standards support the beneficial uses, *i.e.* “. . . assure protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife” (CWA §303(d)(1)). The protection and propagation of indigenous populations does not require “near optimal” temperatures. There is a range of temperatures in which there is good propagation of these species. Most of the studies were laboratory studies that used a constant temperature. It is questionable whether there is a direct correlation between constant temperatures and the variability that exists in streams.

Another area of concern is the adoption of the protection of existing water temperature that is colder than the numeric standard. This does not meet the guidance of the antidegradation provisions of the CWA. Those provisions require maintenance of the conditions unless a process is followed to allow lowering the standard to a minimum of protection for the propagation of the aquatic species.

There appears to be little scientific support for the 90th percentile allowing one year out of ten to exceed the standard. This assumes that the climatic factors such as precipitation and ambient air temperature are relatively constant over a ten-year period. This is not the case. It is common to have an extended period of two to four years of lower precipitation and above average temperatures or cooler and wetter than average. Before a guideline is established, such as nine of ten years meeting the standard, a review of typical longer term weather patterns should be evaluated to determine the frequency of extended warm and dry periods and the probability of occurrence of multiple years of high temperature. If a number is used in this way, it should be substantiated by weather records.

Another area not discussed in the document is the result of natural events, such as large fires that remove the canopy cover over large areas, which includes entire stream reaches that may be important for habitat. Increased water temperatures are likely. Temperature recovery time on those streams may be 10 to 25 years or more before sufficient cover is reestablished and the stream channel has recovered to the pre-fire conditions.

If you have any questions or would like to discuss these comments, contact Ervin Cowley at (208) 373-3810.

Sincerely,

Susan Giannettino
Deputy State Director, Resource Services

cc:
Forest Service R-4
Idaho Department of Environmental Quality

Refer to:
OHB2001-0329-GC

November 26, 2002

Mr. John Iani
Regional Administrator
U.S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Re: October 10, 2002, Draft EPA Region 10 Guidance for Pacific Northwest States and Tribal Temperature Water Quality Standards.

Dear Mr. Iani:

The National Marine Fisheries Service (NOAA Fisheries) appreciates the leadership that the Environmental Protection Agency (EPA) has demonstrated in leading the Regional Water Temperature Criteria Guidance Project (Project). NOAA Fisheries recognizes that stream thermal environments and fish usage of those environments can be highly complex and difficult to portray in water temperature criteria. As lead agency and decision maker in this project, EPA has faced a difficult challenge of developing water temperature guidance that recognizes this complexity, yet encourages development of state and tribal temperature criteria that are both practical for regulatory use and protective of salmonid fishes. By working collaboratively with state, tribal and Federal agencies, EPA is developing guidance that likely will not only help halt thermal degradation of Pacific salmon habitat so that progress toward long-term survival and recovery can begin, but will also lead to more efficient and timely approvals of water temperature standards under the Clean Water Act (CWA) and the Endangered Species Act (ESA).

As part of the public review, NOAA Fisheries is providing additional comments and concerns regarding the draft guidance (Enclosure 1). Following those comments, NOAA Fisheries includes recommendations for subsequent ESA consultations on EPA approvals of state or tribal water temperature standards (Enclosure 2). We look forward to working with EPA in the coming months to resolve outstanding issues and discuss the likelihood of expedited ESA reviews prior to issuance of the final guidance.

If you have any questions regarding these comments, please contact Jeff Lockwood at 503.231.2249, or Robert Anderson at 503.231.2226.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Anne Badgley, USFWS
John Palmer, EPA Region 10
Randy Smith, EPA Region 10

Enclosure 1: Comments on EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards, 2nd Public Review Draft (October 10, 2002)

Enclosure 2: Recommendations for ESA Consultations on Approval of Water Temperature Standards, Habitat Conservation Division, Northwest Region, National Marine Fisheries Service

Enclosure 1

Comments on EPA Region 10 Guidance for State and Tribal Temperature Water Quality Standards 2nd Public Review Draft (October 10, 2002)

Habitat Conservation Division, Northwest Region, National Marine Fisheries Service

SUMMARY

The National Marine Fisheries Service's (NOAA Fisheries) comments on the October 10, 2002, Draft EPA Region 10 Guidance for Pacific Northwest States and Tribal Temperature Water Quality Standards are organized according to the draft document's format. With the exception of the comments on sections I, IV.3 and VII, NOAA Fisheries has limited its comments to substantive issues that affect the ability of the guidance to meet its goals pertaining to the conservation of Pacific salmon and affecting the likelihood of expedited reviews of state or tribal water temperature standards under the Endangered Species Act (ESA).

Issues central to our comments include: (1) The need to designate beneficial uses in a manner that protects the full diversity of life history timing demonstrated by local fish populations; (2) the need to consider current and potential fish use (including areas that would be occupied except for human-caused fish passage barriers) in designating beneficial uses; (3) the need consider both fish abundance and overall habitat conditions when identifying thermal "core areas" for rearing anadromous fish; (4) the need for EPA review and approval of procedures and practices used by states and tribes concerning designation of beneficial uses; (5) the importance of a narrative criterion for identifying and protecting landscape features associated with cold-water refugia for the proposed 18° C and 20° C criteria; and (6) the need for a biologically conservative approach in the application of any exceptions due to unusually warm weather.

I. Introduction

This section should include the project's goal statement.

IV.3. Human-Caused Elevated Water Temperature as a Factor in Salmonid Decline

This section would benefit from inclusion of information from the Carnation Creek watershed study in British Columbia, one of the few studies that quantified changes in fish population characteristics as a direct result of altered habitat and increased water temperature. In Carnation Creek, higher late winter and spring water temperatures following logging increased juvenile coho growth, leading to higher survival overwinter, but caused an earlier seaward migration of smolts, decreasing survival (Holtby 1998). Holtby's conclusions include: (1) Increased temperatures can have quantifiable effects on salmonid populations; (2) these effects can influence more than one life stage simultaneously and in opposite directions; (3) the effects of perturbations at one life stage can persist throughout the remainder of the life cycle; and (4) for

anadromous species, the effects of habitat perturbations during freshwater rearing can persist into the marine phase. Therefore, sublethal temperatures experienced at any one life stage may have repercussions for individual fitness and ultimately population and species viability.

IV.4. General Life Histories of Salmonids and When Human-Caused Elevated Water Temperatures May Be a Problem

In order to protect and restore the genetic diversity of anadromous fish populations and recover listed species, it is vitally important that remnant portions of runs that are able to migrate and spawn earlier or later than the bulk of the population are protected and restored. In the introductory paragraph (p. 11), the guidance should state that the generalized life history information given in the document is not suitable for designating beneficial uses. Specific information about life history timing of local populations or sub-populations, where known, should be used by states and tribes in designating beneficial uses.

V. EPA Region 10 Recommendations for Pacific Northwest State and Tribal Temperature Water Quality Standards to Facilitate Expedited CWA and ESA Review

The first two paragraphs in this section imply that NOAA Fisheries has already endorsed the approaches in the draft guidance and agreed that following the guidance will result in an expedited ESA review of state or tribal water temperature standards. As we stated previously, the likelihood of expedited ESA reviews depends upon EPA and NOAA Fisheries reaching agreement or concluding consultation on the final version of the guidance.

V.1. Cold Water Salmonid Uses and Numeric Criteria to Protect Those Uses

In Table 1 (p. 15), the temperature values given for disease considerations are supported not just by lab studies, but also by field studies and monitoring of disease occurrence and virulence. Additional considerations that should be included for juvenile rearing include competitive ability of salmonid fishes and the occurrence of warm-water competitors, both of which are affected by water temperature.

Cold Water Salmonid Uses.

The guidance document should summarize procedures under the Clean Water Act (CWA) that would apply if a state or tribe decided to change beneficial uses because of this guidance. NOAA Fisheries understands that if a state or tribe proposes beneficial use designations that are less protective than what is currently existing, a use attainability analysis would be required, and that if EPA approves the new use, it would need to consult with NOAA Fisheries under section 7 of the ESA.

Focus on Summer Maximum Conditions.

Because the phrase “summer maximum conditions” is not defined precisely in the draft guidance, the second paragraph in this section (p. 17) could be read to imply that only spawning and egg incubation that occur in late spring-early summer or late summer-early fall would be

protected under the proposed spawning/incubation criterion, and that mid-summer spawning and egg incubation would not be subject to protection. Several Pacific salmon populations can spawn or incubate during mid-summer. For example, Middle Columbia steelhead spawn in the North Fork of the John Day River from 15 March through 15 June. Incubation to emergence of steelhead fry takes 7-9 weeks. Therefore, fry emergence can extend until approximately mid-August

(*i.e.*, mid-summer) in that watershed. Also, spring chinook spawning may begin as early as July in some watersheds, and extend throughout the summer maximum period. The document needs to clearly explain that the most sensitive life stage that occurs during any given time of year needs to be protected during that period.

General Target for Protective Criteria.

Regarding the statement on p. 17 that “...water temperatures can also be too cold for salmonids, but that is generally a natural condition and not an issue for water quality standards,” NOAA Fisheries agrees that in many instances cooler than optimal water temperatures can result from natural conditions (*e.g.*, glacial runoff or cool air temperatures). However, seasonal shifts in temperature are often related to the construction and operation of large water storage projects. Typically, downstream water temperatures are cooler than the pre-project condition during the late winter and spring, and warmer in the fall (Karr *et al.* 1998). Examples include Grande Coulee Dam on the Columbia River, Brownlee Dam on the Snake River, and Cougar Dam on the South Fork McKenzie River. The effects of this thermal shift on salmonids can include delayed migration and spawning for adult spring-run chinook, reduced length and weight at hatch, delayed emergence for fry (late-fall spawning salmon), reduced growth, and delayed out-migration.

Criteria Apply to all but Unusually Warm Conditions.

The draft guidance does not adequately explain the proposals to base attainment of the proposed criteria on the 90th percentile of the yearly maximum water temperatures (7DADM) over a period of 10 years or more, or to exclude water temperature data when the air temperature during the warmest 7-day period of the year exceeds the 90th percentile of the yearly maximum air temperatures (7DADM) calculated in yearly series over the historic record. EPA should clarify the guidance by providing a more complete description of how this proposed exemption could be used, and of the implications for both point- and non-point discharges. Some examples using actual atmospheric and stream temperature data could be most helpful.

NOAA Fisheries is concerned that proposed exemptions for warm years likely would often coincide with drought conditions when in-stream flows are likely to be lower, placing listed fish under additional, possibly lethal, stress. Exemptions for point-source dischargers during such periods could exacerbate these stressful conditions, potentially leading to increased disease and mortality of listed species.

The guidance states that the exemption would be allowed only once in 10 years. However, because the exemption could be based on a period of greater than 10 years, it is possible that several years of unusually warm weather in a row could result in an exemption that is used multiple times in a 10-year period.

In order to evaluate this component of the proposed guidance, NOAA Fisheries requests that EPA describe how the exemption would affect a state or tribe's CWA 303(d) list of impaired waters and TMDLs. Under what conditions would a stream that was already on a 303(d) list be removed from the list because of this provision? Would restoration efforts under a total maximum daily load (TMDL) that were only partially complete be stopped because the river received an exemption from the water temperature criteria during a warm year? Use of this provision does not seem appropriate for waters that already are included in a TMDL due to a previous 303(d) listing.

NOAA Fisheries recommends that any state or tribe proposing to use this exemption be required to use the guidance's "natural background provisions" to demonstrate that the exceedence is due solely to unusual atmospheric conditions.

Current versus Potential Use.

Regarding EPA's recommendation (p. 20) that "...salmonid use designations be designated in waters where the use currently occurs or is suspected to occur (today), and where there is reasonable potential for that use to occur if temperatures were to be restored in areas with degraded habitat," the guidance should recognize that in some watersheds, it will take restoration of a variety of degraded habitat conditions and functions (not just restoration of temperatures), as well as removal of artificial barriers to fish passage, to achieve potential fish distribution.

Regarding the statement (p. 20) that "For areas with minimal habitat degradation, current use is appropriate," stream reaches that have suitable habitat but are not occupied by anadromous fish due to human-caused fish passage barriers should be designated as "current use." Even river reaches with good physical, chemical and biological habitat conditions can lack anadromous fish that would otherwise be present but for human-caused fish passage barriers such as dams, culverts, or chemical contamination downstream. NOAA Fisheries recommends that EPA review how states and tribes decide which habitats are degraded and which are minimally degraded during its review of beneficial use designations.

Regarding the statement (p. 20) that "EPA recognizes that establishing use designation based on where there is reasonable potential for the use to occur in areas of thermally degraded habitat depends on best professional judgement," NOAA Fisheries recommends that such an exercise should be *based* on the best available scientific and historical information about potential fish distribution (*e.g.* habitat suitability models, comparative studies, historical fish survey information, *etc.*), which then could be *applied* using best professional judgement.

Integrating the General Factors in Selecting Protective Criteria.

The statement (p. 21) that "Adopting a numeric criterion near the warmer end of the optimal range that is applied to the above conditions (near worst case) will result in temperatures near the middle of the optimal range most of the time where most of the use occurs" is potentially confusing. EPA should consider expanding its explanation of this concept and including graphical representation of stream temperature data to support this assertion.

V.1.2. Discussion of Use and Criteria Presented in Table 3

The discussion of the application of the salmon/trout “core” juvenile rearing criterion in Table 3 (p. 23), and on p. 25, should include the concept of applying the criterion not only where the use occurs today, but also where the use is suspected to occur (as described on p. 20). This concept is essential for NOAA Fisheries to consider this criterion adequate for the conservation of juvenile Pacific salmon.

The explanation of how the salmon/trout “core” juvenile rearing criterion would be applied in “areas of minimally degraded habitat” (“based on density and/or habitat features”) is not adequate for NOAA Fisheries to evaluate the implications of this provision. The provision needs to outline how to determine “minimally degraded habitat,” explain what “core” habitat means, and clarify that “density” refers to juvenile fish abundance per habitat unit. This provision should be applied not on the basis of habitat conditions in “areas” (which implies stream reaches), but on the basis of watersheds, since this is the logical scale for the conservation of anadromous fish populations (Reeves and Sedell 1992, Frissell 1993, Frissell *et al.* 1993, Li *et al.* 1995, Botkin *et al.* 1995, National Research Council 1996). Core areas should include both watersheds areas that are currently highly productive for rearing, and watersheds with high quality habitat that would support rearing at high densities once fish passage or other problems that prevent full seeding by spawning fish (and therefore prevent full attainment of rearing potential) are remedied. Identification and designation of such watersheds likely will be a function of subbasin reviews and recovery planning; identification of core areas for purposes of water temperature criteria should be done in the context of such efforts. Proposals to use this provision should be tied to the best available scientific information and subjected to interagency, public and scientific peer review.

Table 3 states that the 18°C criterion for salmon/trout juvenile rearing and juvenile/adult migration “Applies to waters where summer salmon and juvenile trout rearing currently occurs and may potentially occur.” Even though the next sentence points out that this use extends downstream from the “core” juvenile use, this statement seems to conflict with the direction to apply the 16°C criterion to the “furthest downstream extent of current summer [juvenile rearing] use for areas of degraded habitat where current summer distribution is shrunken relative to historical distribution.” NOAA Fisheries recommends that EPA further clarify application of the 18°C criterion in Table 3.

Regarding the 14°C criterion for steelhead smoltification, the Fahrenheit (F) value of 14°C is 57°F, not 61°F as is stated in Table 3.

The draft guidance is silent on how water temperature monitoring should be done to determine compliance with the recommended standards. Due to the lack of a recommended monitoring protocol in the draft guidance, NOAA Fisheries will need to discuss monitoring approaches as individual state and tribal standards are submitted by EPA for ESA approval. NOAA Fisheries would welcome the opportunity to work with other entities that participated in the water temperature project to develop a regional monitoring protocol.

Salmon and Trout “Core” Juvenile Rearing.

NOAA Fisheries supports the 16°C (as a 7DADM) as generally protective of rearing Pacific salmon, provided that beneficial use designations include the full spatial and temporal extent of known and suspected rearing habitat, and habitat that would be used for rearing if human-caused fish passage barriers were removed. Achieving this temperature in rearing habitat would be a major contribution toward removing water temperature as an impediment to Pacific salmon recovery.

The draft guidance states on p. 25 that “This criterion... in many cases protect for [sic] late summer salmon spawning and early summer incubating trout eggs that occur in these waters...”. NOAA Fisheries is concerned that the document is implying that the 16°C criterion is protective of spawning and incubation, even though in other sections the guidance recommends a criterion of 13°C for protection of salmonid spawning and incubation. NOAA Fisheries recommends that EPA remove this statement from the guidance, or more clearly explain how application of the rearing criterion could protect salmonid spawning and incubation.

Salmon and Trout Juvenile Rearing and Juvenile/Adult Migration.

NOAA Fisheries acknowledges that one of the temperature project’s goals was to recognize the natural variability in river temperatures (including the gradual downstream warming), and that not all river reaches need to be protected as “core” juvenile rearing habitat. For these reasons, NOAA Fisheries can support inclusion of the 18°C criterion in the guidance. On the other hand, NOAA Fisheries is concerned about the risk of disease in migrating or holding chinook salmon in areas subject to the 18°C 7DADM criterion.

The draft guidance states on p. 25 that the 18° C (7DADM) criterion is designed to protect juvenile rearing, and adult and juvenile migration, downstream from core juvenile rearing habitat. Part of the rationale for this criterion is that it would “prevent adults and juveniles from prolonged exposure of 16-17° C that can lead to elevated disease rates.” As explained on p. 18 of the guidance, the 7DADM temperature for many rivers and streams in the Pacific Northwest is about 3°C higher than the maximum weekly average temperature (MWAT) (*i.e.* the MWAT temperature in a river meeting the 18° C criterion would be approximately 15°C). The guidance also explains that the “mid-point” between the mean and the maximum is the “equivalent” constant temperature. Using this approach, the 7DADM temperature of 18° C is equivalent to a constant temperature of about 16.5°C; a temperature associated with elevated disease rates (Table 3). Since larger rivers (which would be covered by this criterion) demonstrate relatively little diurnal variation in temperature, the MWAT in a river with a 7DADM temperature of 18°C would likely be in the 16-17° range, so the equivalent constant temperature would 17.0-17.5°C, which poses even greater risk of disease.

The draft guidance acknowledges this risk of increased disease during summer maximum temperature conditions for rivers with little diurnal variation, but dismisses the concern since “out-migrating juveniles have generally completed their out-migration by this time and the number of adults migrating through these waters at this time is limited and of short duration.” This information is not entirely accurate. Fall chinook juveniles from Columbia River tributaries out-migrate throughout the summer. Spring chinook generally enter freshwater in January-May

(Columbia River), April-July (Puget Sound), April-August (Washington Coast), and April-July (Oregon Coast) (Bell 1991, Myers *et al.* 1998). Summer chinook generally enter freshwater in early to mid-summer. Due to these entry times, adults of both races of chinook often can be found migrating or holding in large and medium sized rivers during the summer maximum period. Summer steelhead migrate upstream in May-October (Busby *et al.* 1996). Since steelhead spawn in the spring, these fish must hold in spawning tributaries or in mainstem rivers throughout the summer while awaiting the spring to begin spawning.

In order to reduce the risk of increased disease in migrating or holding chinook salmon, NOAA Fisheries recommends that EPA extend the narrative criterion pertaining to cold water refugia to include mainstem rivers with chinook or steelhead where the 18°C (7DADM) criterion would be applicable (see also comments on the narrative criterion immediately below).

Salmon and Trout Migration (With Cold Water Refuge Narrative Provision).

NOAA Fisheries does not object to EPA's inclusion of a criterion of 20°C (7DADM) with a narrative criterion pertaining to cold water refugia, however, we have several recommendations to strengthen the provision. NOAA Fisheries recommends that EPA specify in the guidance that cold water refugia include the following features: (1) The alluvial aquifer, (2) the phreatic zone, (3) the hypothetic zone, (4) the paleochannel, (5) the streambed, and (6) the riparian zone (Poole and Berman 2001).

NOAA Fisheries also recommends that EPA provide guidance about how to develop the information needed to demonstrate that "maximum temperatures likely reached 20°C prior to significant human alteration of the landscape" (p. 26). This guidance could include a discussion of the types of modeling available, and of the utility of other information (*e.g.* historical temperature data and fish distribution data). We also recommend that the narrative criterion include not only a demonstration of the physical restoration of cold-water refugia, but also a discussion of how well the beneficial uses of salmonid migration and holding are being protected by the combination of the numeric and narrative criteria. Proposals to use this provision should be tied to the best available scientific information and subjected to interagency, public and scientific peer review.

The guidance would benefit from a discussion of how the numeric and narrative criteria would work together, and how they would be applied for both point- and non-point pollution sources.

Salmon and Trout Spawning, Egg Incubation, and Fry Emergence.

NOAA Fisheries supports the proposed 13°C criterion recommendation as being protective of spawning, incubation and fry emergence for Pacific salmon, provided that beneficial use designations include the full spatial and temporal extent of known and potential spawning.

Steelhead Trout Smoltification.

NOAA Fisheries supports the proposed 14°C criterion recommendation as being protective of smoltification in steelhead, provided that beneficial use designations include all river reaches where early stages of smoltification are known, or suspected, to occur, or would occur if human-caused fish passage barriers were removed. NOAA Fisheries recommends that the guidance

note that this criterion applies not only to the Columbia/Snake River system, but also to other basins with steelhead (*i.e.* coastal watersheds in Oregon and Washington, and Puget Sound). EPA should include in the guidance available information about the timing of steelhead smoltification for areas outside the Columbia/Snake River system.

V.2. Adoption of Regulatory Provisions to Protect Existing Water Temperature that is Colder than the Numeric Criteria

Although NOAA Fisheries supports EPA's intent to protect waters that are colder than the proposed criteria, we recommend that this provision apply not only to ESA-listed salmonids, but to all salmonids for which essential fish habitat has been designated under the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR 600). Also, NOAA Fisheries recommends that these provisions apply in both known and potential habitat (*i.e.* habitat that would be occupied if habitat and/or fish passage were restored). Protecting existing high quality thermal habitat until fish can recolonize an area is consistent with conservation biology principles and would be more efficient than attempting to restore the thermal conditions after warming has been allowed.

V.3. Adoption of Mixing Zone Provisions to Protect Salmonids

Although EPA has addressed some of our previous concerns regarding effects from mixing zones for effluent discharges, NOAA Fisheries is concerned that the guidance does not acknowledge the complexity of existing mixing zone provisions in state and tribal water quality standards. In some cases there are different mixing zone standards for different kinds of water bodies

(*i.e.* rivers, streams, estuaries, lakes, and the ocean). It does not appear that EPA has considered the range of effects that could occur to the various Pacific salmon life stages that can occur in different types of water bodies. Also, some standards allow overlapping mixing zones, or exceptions to mixing zone provisions under various circumstances. The guidance does not explain how the proposed provisions would fit into existing standards for mixing zones (*e.g.*, would the proposed provisions supplement or supplant existing provisions?). The guidance also does not address the issue of adding pollutants to water bodies on a CWA 303(d) list (as often occurs when mixing zones are employed), or describe the limits of EPA's authority in this situation.

EPA has not provided the scientific basis for some of the provisions recommended in this section (*e.g.* the instantaneous lethality provision, and the migration blockage provisions that are based on cross-sectional areas of the water body). The temperature limits are based on limits within mixing zones or zones of initial dilution (ZID), but these zones commonly are described based only on models and are not monitored.

Because of the unresolved issues described above, the mixing zone provisions do not appear to be sufficiently developed to be considered for expedited ESA review. NOAA Fisheries recommends that EPA address the issues listed above to the extent possible but move the mixing zone provisions to section VI of the guidance. NOAA Fisheries would welcome the opportunity

to continue discussing mixing zone provisions as state and tribal water temperature standards are revised and proceed through CWA and ESA approval processes.

VI.2. Use of a State's or Tribe's "Natural Background" Provisions

The guidance needs to define "significant human impacts" which appears in the discussion of waters that exceed numeric criteria due to a combination of apparent natural background conditions and human impacts (third paragraph of this section). Some human heat sources that are not significant by themselves may become significant when cumulative effects are considered. NOAA Fisheries recommends that EPA explain why restoration of alluvial river segments could *not* be included in a natural background estimate in the fourth paragraph of this section.

VII. The Role of Temperature WQS in Protecting and Recovering ESA-Listed Salmonids and Examples of Actions to Restore Suitable Water Temperatures

An additional measure to help move streams toward meeting water temperature standards would be to reduce sediment inputs to streams, as increased sediment loads make streams wider and shallower, and therefore more subject to warming.

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Enclosure 2

Recommendations for ESA Consultations on Approval of Water Temperature Standards Habitat Conservation Division, Northwest Region, National Marine Fisheries Service

Recognizing that streamlining of ESA section 7 compliance is one of the primary objectives of the criteria guidance, NOAA Fisheries is providing EPA with recommendations for ESA consultations on approval of water temperature standards. NOAA Fisheries recommends that:

1. EPA complete a separate consultation with NOAA Fisheries on each “may affect” approval action EPA takes on a state or tribal temperature standard or beneficial use designation.
2. EPA work with the states and tribes to develop required biological evaluations or assessments. NOAA Fisheries strongly encourages early coordination during this phase.
3. During ESA consultation, EPA will provide: (1) A clear and complete description of the proposed action (including specifics such as how the state or tribe developed its standard, how it designated beneficial uses, *etc.*); (2) a full description of the environmental baseline including a summary of current physical, chemical and biological habitat conditions; and (3) a full analysis of the effects of the action, including the direct and indirect effects of the action, together with the effects of other activities that are interrelated or interdependent with that action, and cumulative effects (50 CFR 402.02).

NOAA Fisheries looks forward to working with EPA and affected states and tribes during anticipated ESA consultations in order to facilitate and streamline the process as much as possible.

AES/EC

Mr. John Iani, Regional Administrator
U.S. Environmental Protection Agency
Region 10
1200 6th Avenue
Seattle, Washington 98101

Dear Mr. Iani:

We, the U.S. Fish and Wildlife Service, appreciate the opportunity to provide comments on the proposed Environmental Protection Agency (EPA) Region 10 Guidance for State and Tribal Temperature Water Quality Standards (dated October 2, 2002). As a member of the workgroup developing this guidance document over the last 2 years, we are committed to and supportive of this effort. We wish to commend EPA for addressing this large scale and difficult issue as it is a critical factor in the recovery of threatened and endangered species as well as in the ecological function of many water bodies in the Pacific Northwest. The following comments describe the issues we discussed in the numerous multiagency meetings held over the last 2 years, including the recent meeting with the Regional Administrators.

This version of the guidance document has addressed many of the issues and concerns we previously identified. We believe this guidance will be a valuable tool for States and Tribes in the development of their water quality standards. More specifically, because we were involved in this development process, together with the States and Tribes, it is our hope the guidance will offer an insight and framework for addressing our concerns early in the standards development process while allowing adequate flexibility for States and Tribes to consider local influences and issues.

Provided below are some specific comments and recommendations related to this latest version of the guidance, arranged according to section. Please consider these comments as part of the public review process.

(Section V.1) Criteria Apply to all but Unusually Warm Conditions

We share the concerns expressed by NOAA-Fisheries concerning the exemption during the hottest year in a 10-year period. The Bull Trout Temperature Thresholds Peer Review Summary states: "The risk to the population will be a function of the duration of the period of super-optimal temperatures and the magnitude of the super-optimal temperatures. If the duration is short or the super-optimal temperatures are only slightly higher than the optimal temperature, then the risk is relatively low. Increasing either the magnitude of the super-optimal temperatures

or the duration of the interval during which they occur will increase the risk. If EPA is concerned with minimizing risk, then lower optimal temperatures will give the largest buffer or cushion before negative effects are observed.” Although factors in addition to temperature could influence risk, our comments are focused on temperature as addressed in the guidance. We recommend the guidance document either be more explicit in describing conditions where the aforementioned exception would occur, or remove this provision from the guidance.

(Section V.1) Current versus Potential Use

We support the EPA recommendation that “cold water salmonid usage be designated in waters where the use currently occurs or is suspected to occur (today), and where there is reasonable potential for that use to occur if temperatures were to be restored in areas of degraded habitats.” A major factor in listing the bull trout was fragmentation of habitat. This provision in the EPA guidance is supportive of bull trout recovery and recognizes that to recover the bull trout it will need to occupy habitat that is currently unoccupied.

(Section V.1.1) EPA Recommended Salmonid Uses and Number Criteria and (Section V.1.2) Discussion of Use and Criteria Presented in Table 3

The EPA guidance includes temperature criteria for Bull Trout Migration as a part of the Salmon/Trout "Core" Juvenile Rearing criteria. As we have previously discussed with you, we have several concerns and recommendations related to this criteria.

EPA describes the core juvenile salmon rearing and bull trout migration use as occurring "generally in a river basin's mid-to-upper reaches." In some areas, such as in western Washington rivers, bull trout use generally goes to the mouth of the river - and even into the marine waters. Bull trout use often extends beyond core juvenile salmon rearing. It is our understanding that wherever bull trout and non-core rearing (18° C criteria) and migrating salmon (20° C criteria) overlap, the proposed EPA bull trout use criteria (16° C) would supercede these other salmon criteria.

We are unaware of evidence to support a numeric criteria of 16°C 7DADM as being protective of bull trout. Information from Oregon's 1992-1994 Water Quality Standards Review identified adult migration occurring at 10-12°C; highest adult densities are at temperatures less than 12° C; and adult bull trout prefer streams between 9° and 13° C (Buchanan and Gregory 1997). The Bull Trout Temperature Peer Review Panel (Myrick 2002) was asked to evaluate the risk to migratory bull trout if temperature criteria differ for this life stage from the criteria for the juvenile life state. Their summary stated, “In general, adult fish are less tolerant of temperatures than smaller fish of the same species.”

Research is currently underway that will provide data on the temperatures that sub-adult and adult bull trout experience. We recommend that, if adopted by EPA for their temperature guidance, the 16° C 7DADM criteria for migratory bull trout be an interim criteria and be revisited, and revised if necessary, within 5 years of EPA’s final temperature guidance.

Due to the uncertainty regarding the adequacy of 16°C 7DADM to be protective of migratory bull trout, and the importance of cold water refugia for allowing bull trout to thermoregulate when in above optimal temperature waters, we believe it is important to require protection of cold water refugia in 16°C and 18°C waters as well as in the 20° C 7DADM waters. We recommend that EPA define “cold water refugia”, including specifics on spatial and temporal characteristics for river reaches where this protection would apply. Alluvial reaches are one example of where this cold water refugia are likely to occur.

We believe the proposed 12°C 7DADM will protect bull trout juvenile rearing under some conditions. However, based on our review of bull trout temperature studies, the information in the “Bull Trout Temperature Thresholds Peer Review Summary,” and the likelihood of food limitation and inter-species competition in the field, we continue to support the 11°C 7DADM for adequate protection of bull trout juvenile rearing. On a related note, it is our understanding EPA acknowledges that in many bull trout juvenile rearing areas temperatures will need to drop to 9°C to initiate spawning in the fall. We suggest a scientifically rigorous study be conducted in order to validate the assumption that natal streams that meet the rearing criteria will actually drop to meet the spawning initiation temperatures at the normal time of spawning.

(Table 2) Summary of Temperature Considerations for Bull Trout

Spawning is initiated when temperatures in the fall drop to 9°C or less. It is important to note that this is a spawning season daily maximum, not a constant temperature. According to the guidance, a constant temperature falls between 7DADM and weekly mean. Describing spawning initiation at 9°C “constant” would allow the spawning season daily maximum to be several degrees warmer than 9°C. When temperatures go above 9°C during the spawning period, spawning has been observed to stop and not resume until temperatures drop to 9°C.

It is our understanding the final guidance provided to the States and Tribes is not obligatory and will be used at their discretion. We support the guidance document and this effort. We are also expecting the EPA to consult under section 7 of the Endangered Species Act on their approval of the States and Tribes proposed criteria. As noted above and in the current version of the guidance document, we anticipate that this guidance will facilitate the consultation process in the future.

Finally, the we appreciate the open dialogue and cooperative nature in which the EPA has facilitated this multi-agency workgroup process to develop the guidance document. If you have any questions regarding these comments, please contact Stephen Zylstra at (503) 231-6179. Thank you.

Sincerely,

Regional Director

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Mr. John Iani, Regional Administrator

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ZYLSTRA/STEFFECK:drs December 16, 2002

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